PHYSICS AND ASTRONOMY SELF-STUDY APPENDICES

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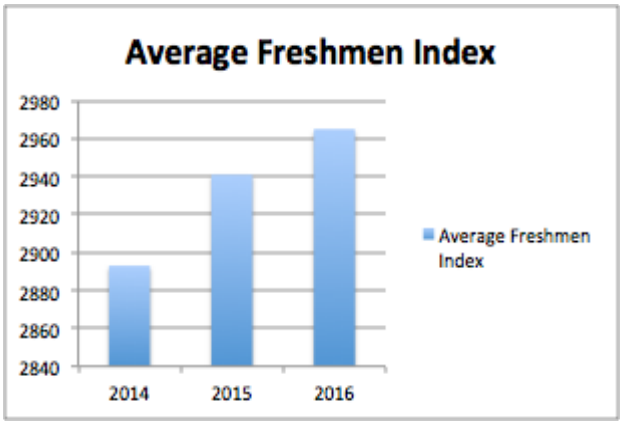
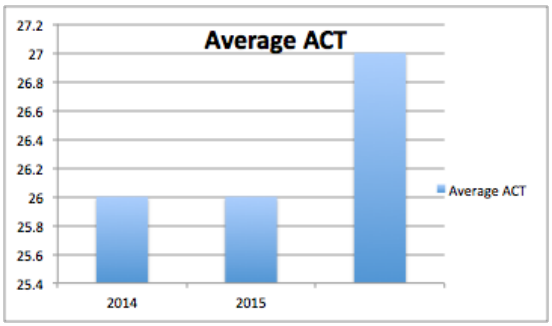
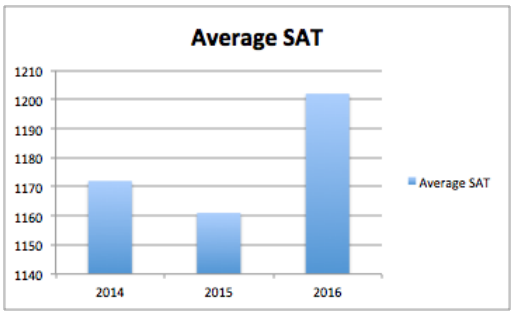
A1 Quality of Entering Undergraduates

Indices Measuring the Quality of New Undergraduates in Physics (1.a.1)

	Quality of Undergraduate Students	Fall 2014	Fall 2015	Fall 2016
Physics BS	Standardized Test Scores - SAT	1166 (N=32)	1161 (N=27)	1213 (N=30)
Arts & Sciences	Standardized Test Scores - SAT	1095	1091	1108
GSU	Standardized Test Scores - SAT	1085	1080	1055
Physics BS	Freshman Index	2909 (N=39)	2941 (N=39)	2965 (N=45)
Arts & Sciences	Freshman Index	2793	2815	2851
GSU	Freshman Index	2779	2794	2802
Physics BS	High School GPA	3.44 (N=39)	3.53 (N=37)	3.50 (N=44)
Arts & Sciences	High School GPA	3.41	3.44	3.49
GSU	High School GPA	3.41	3.43	3.34



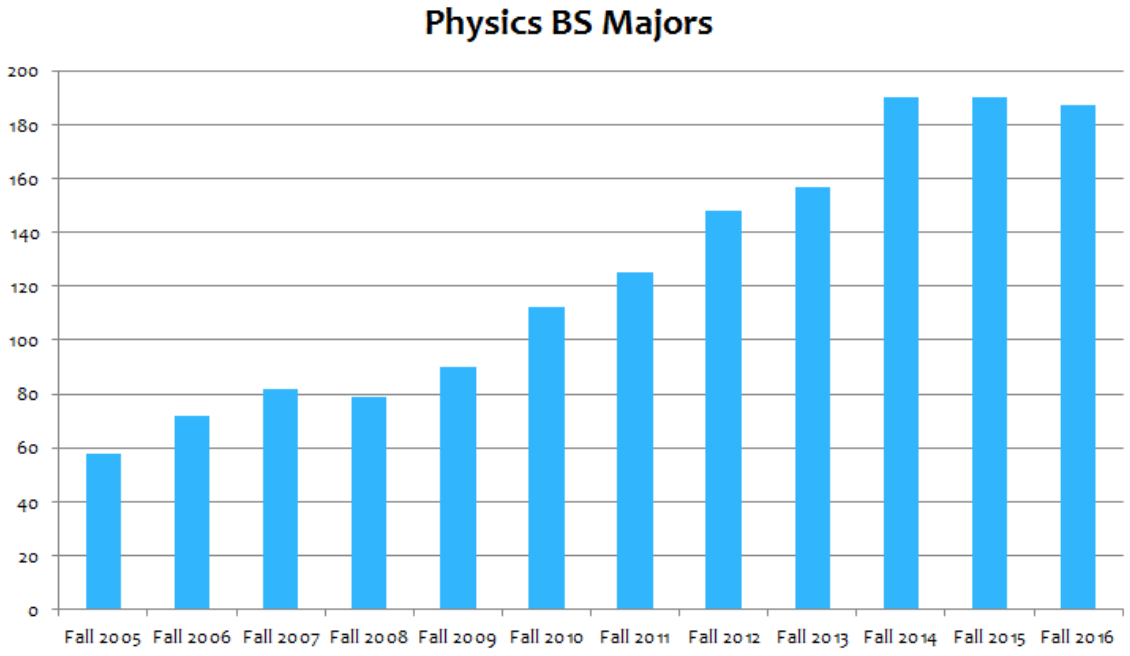


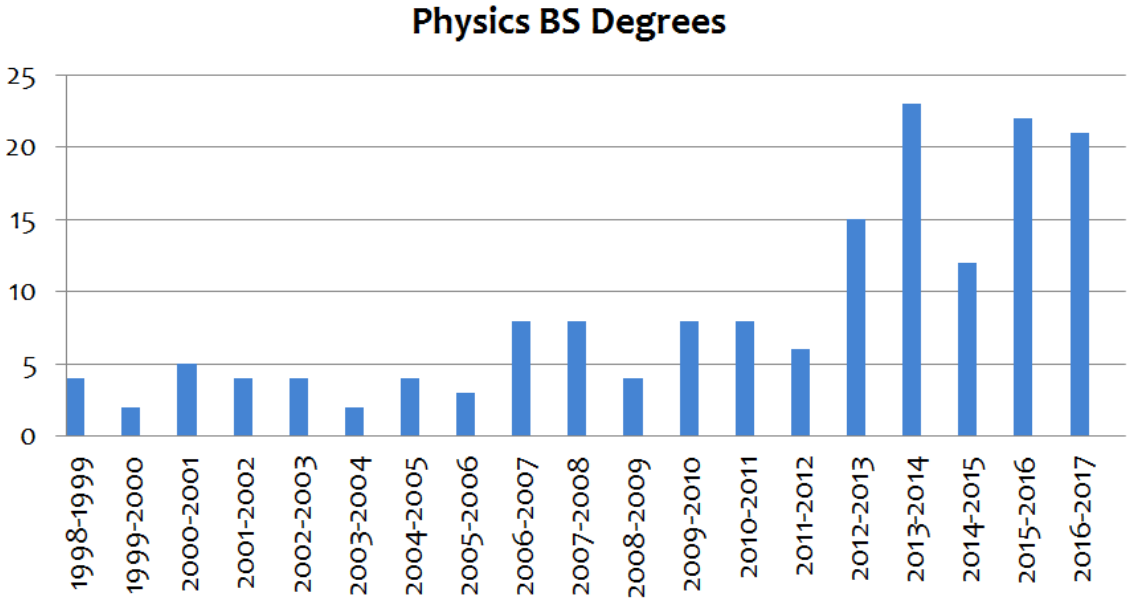


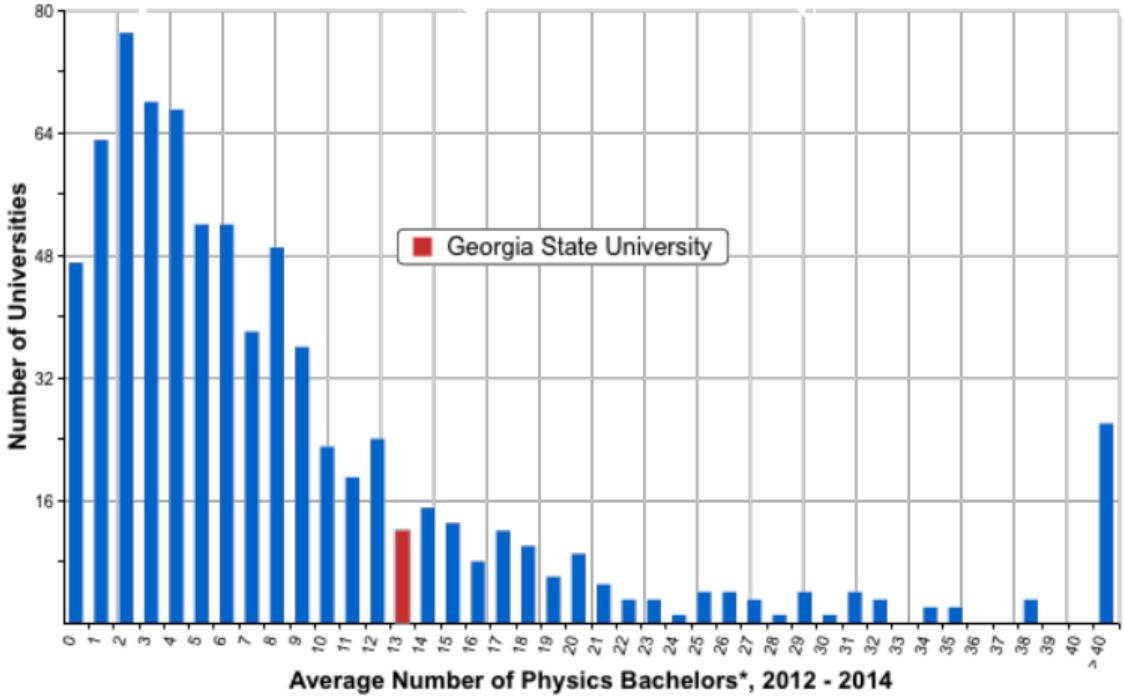
Histograms of different freshman academic scores.

A2 Retention, Progress Toward Degree and Graduation Rates for Recent Cohorts

Historical Growth in the Physics Major (1.a)

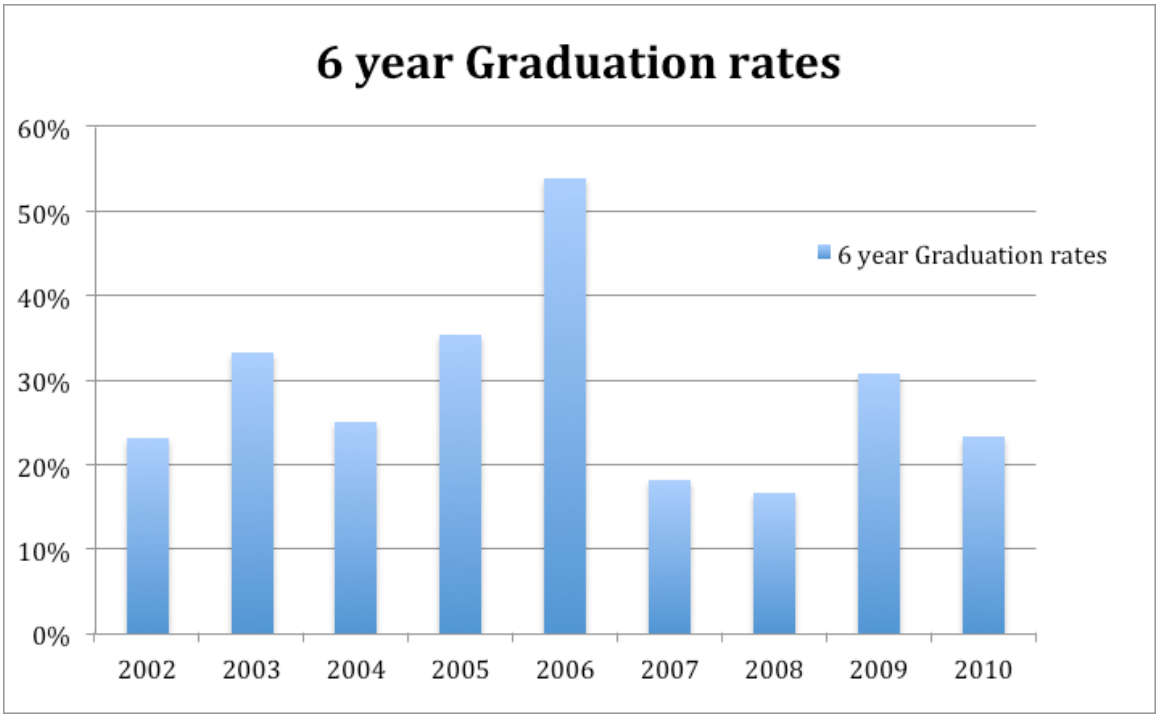


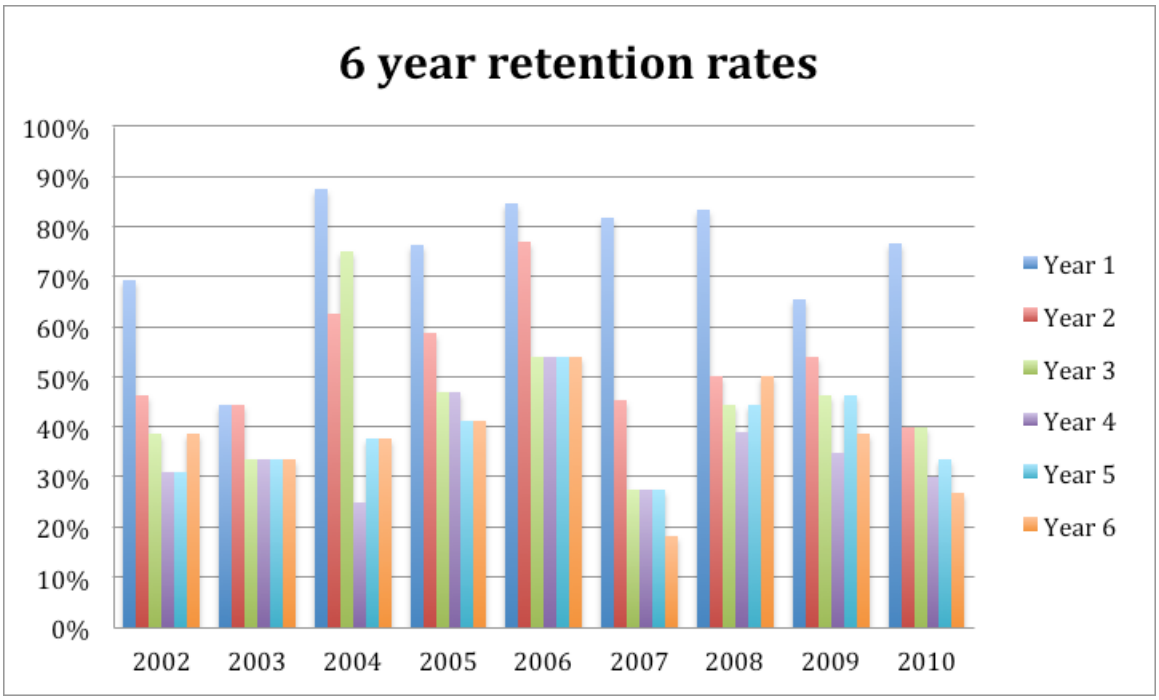


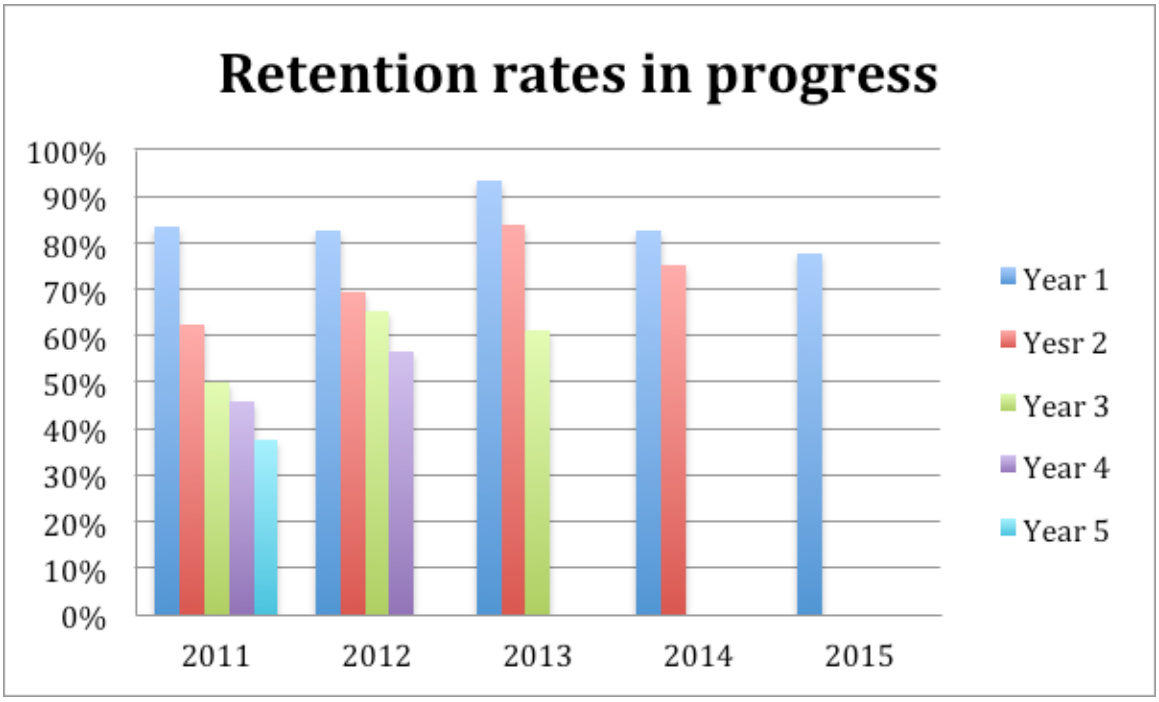


Average number of BS physics degrees awarded per year at all U.S. schools (751) offering the degree. The GSU program was among the top quartile of schools in degrees awarded, and the numbers have increased since that time (see above). From data compiled by the American Physical Society (APS): www.aps.org/programs/education/statistics/compare.cfm

Retention and Graduation Rates (1.a.3.3)





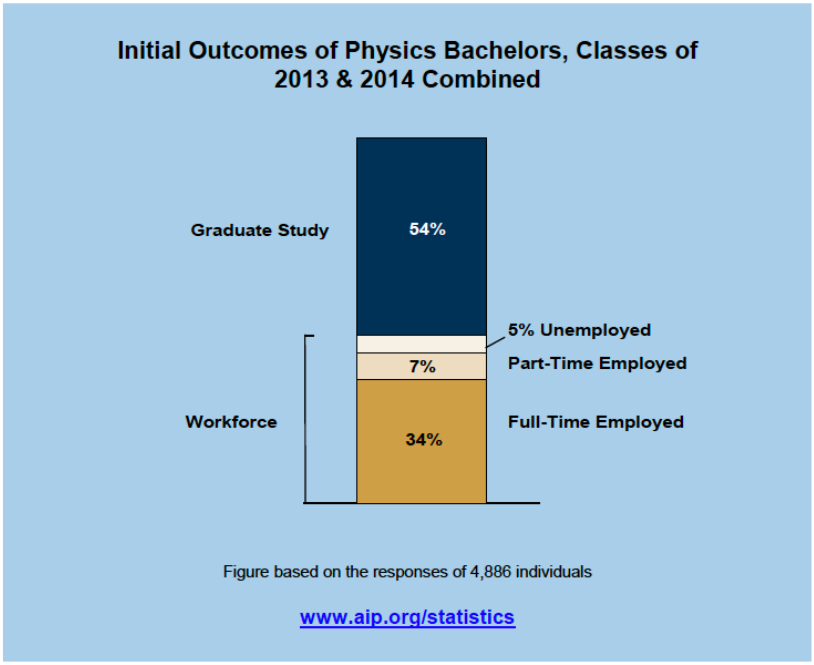


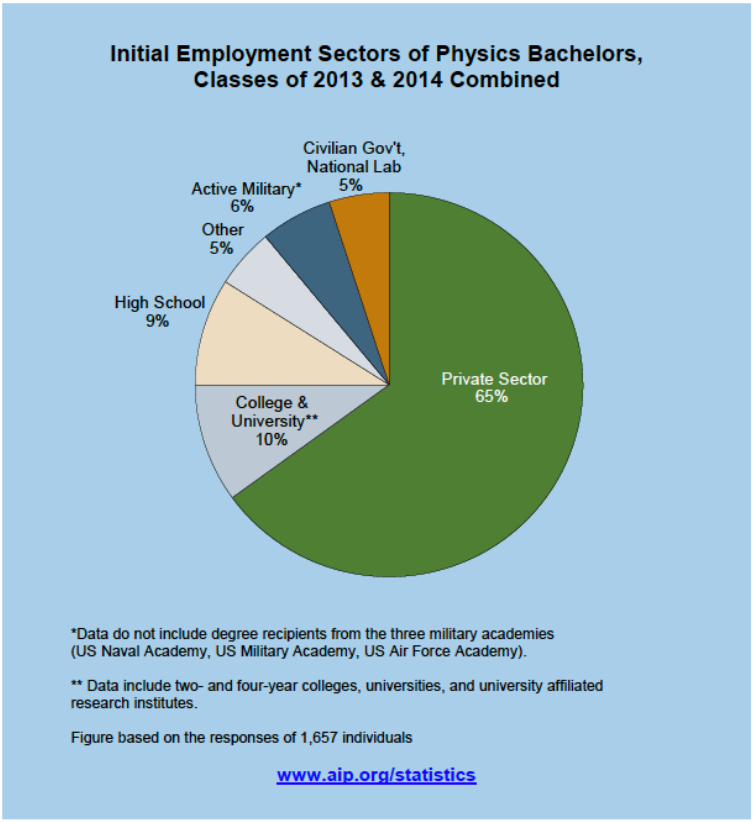
Degree Major	Cohort FA 2011	YR 1 ENRL FA 2012	YR 1 GRAD FA 2012	YR 1 RETD FA 2012	YR 2 ENRL FA 2013	YR 2 GRAD FA 2013	YR 2 RETD FA 2013	YR 3 ENRL FA 2014	YR 3 GRAD FA 2014	YR 3 RETD FA 2014	YR 4 ENRL FA 2015	YR 4 GRAD FA 2015	YR 4 RETD FA 2015
BS Physics	13	9	0	9	6	2	8	1	5	6	0	6	6

Four-year enrollment statistics that follow the Fall 2011 entering class of physics majors. ENRL=enrolled, GRAD=completed, RETD=retained.

Post-graduation Employment Trends (1.a.3.4)

Physics bachelors in the combined classes of 2013 and 2014 enrolled in graduate school or entered the workforce in approximately equal proportions.





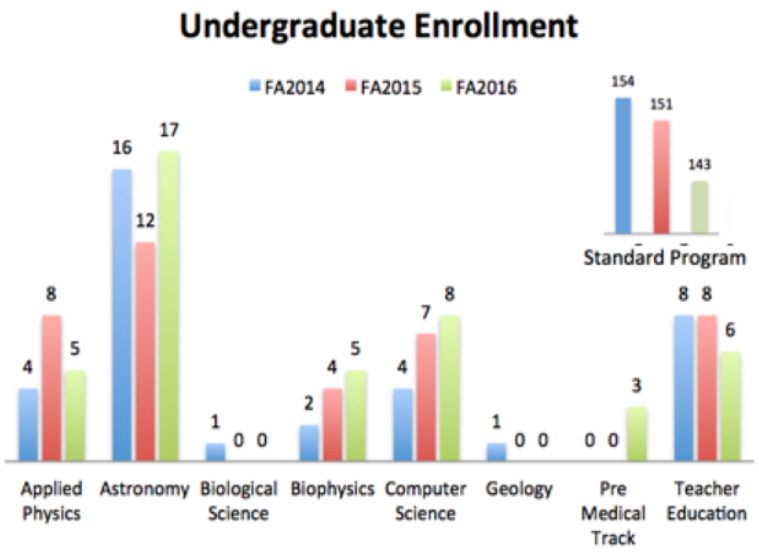
Although physics bachelors work in a variety of sectors of the economy, the private sector continues to employ the largest proportion of new graduates.

Both figures from *Physics Bachelors: Initial Employment* (Mulvey & Pold 2017, AIP).

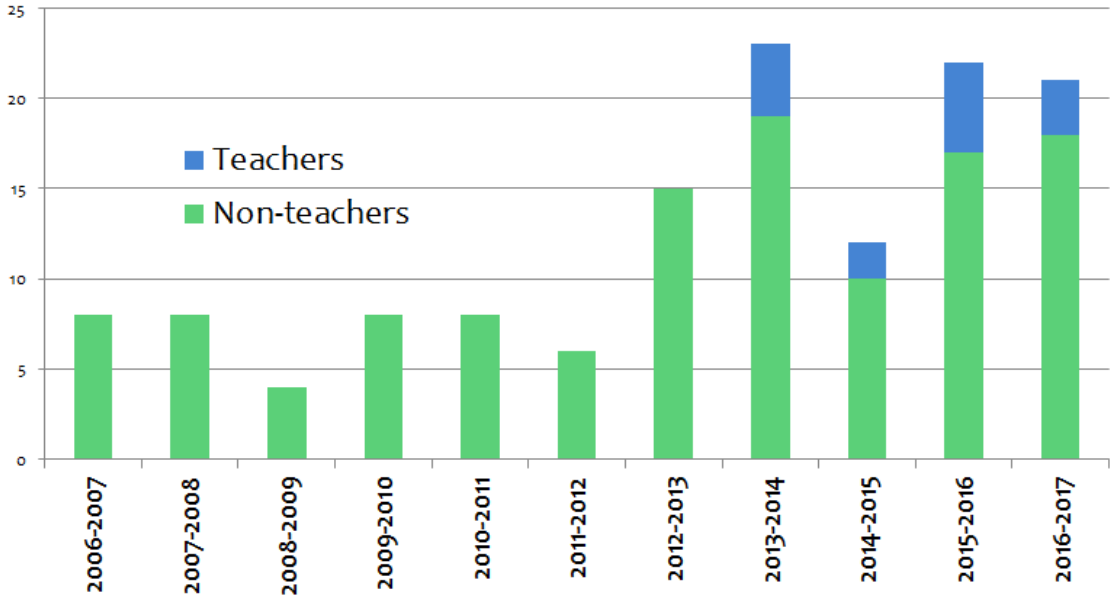
A3 Undergraduate Population

Undergraduate Enrollment by Concentration (1.a.3.5)

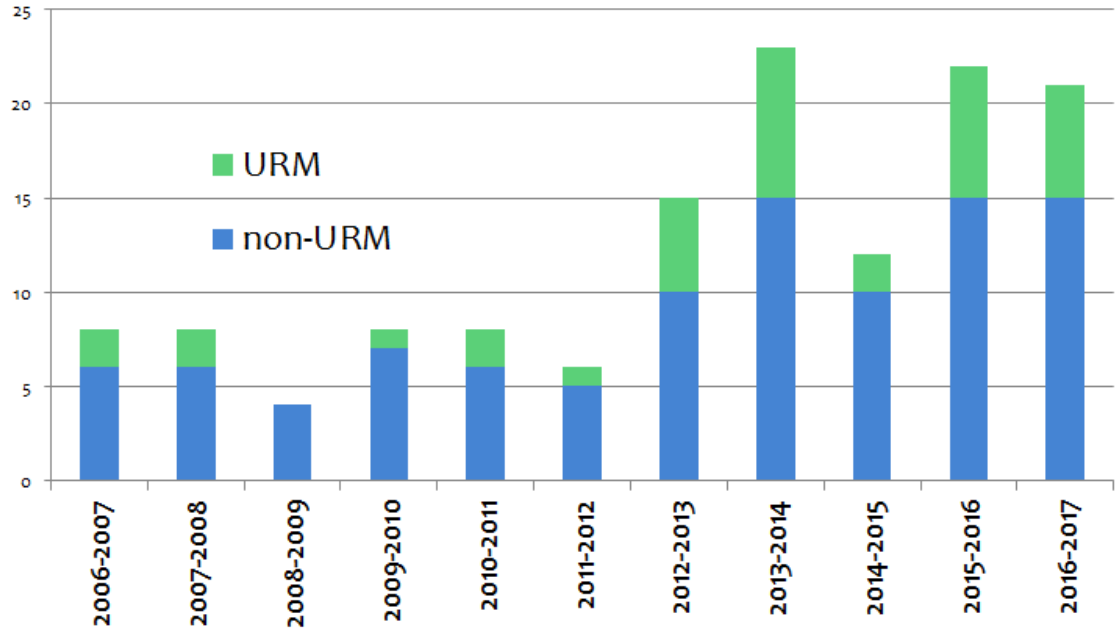
Major	Concentration	FA 2014	FA 2015	FA 2016
Physics	Applied Physics	4	8	5
Physics	Astronomy	16	12	17
Physics	Biophysics	3	4	5
Physics	Computer Science	4	7	8
Physics	Geology	1	0	0
Physics	Pre-Medical Track	0	0	3
Physics	Teacher Education	8	8	6
Physics	Standard	154	151	143
Degree Total (BS)		190	190	187
Department Total		190	190	187



Enrollment by Teacher Education Track: Majors



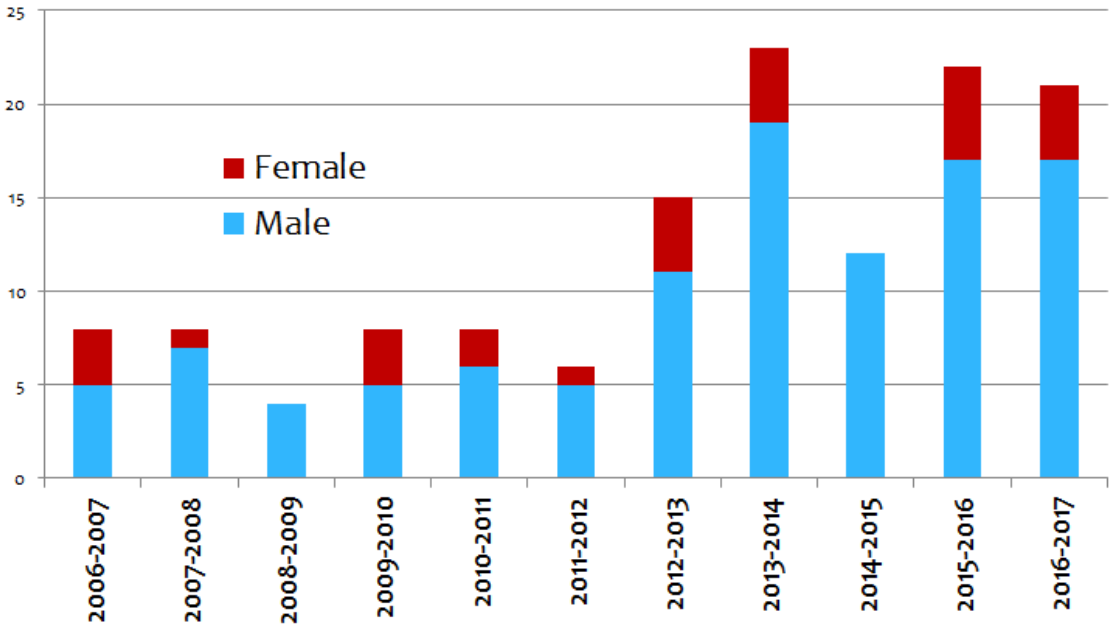
Enrollment by Race: Majors (1.a.3.5)



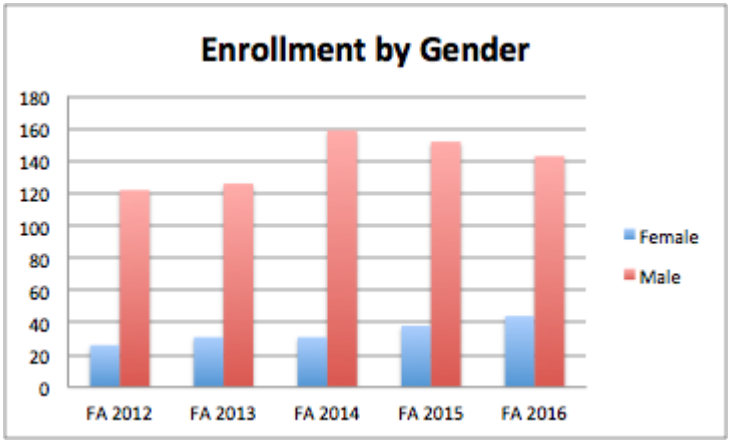
Enrollment by Race: All Undergraduates

UG Enrollment by Race								
Term	Asian	Black	White	Natv HI/Pa Isld	Am Ind/AA Natv	Not Reported	Multi-Racial	Total
FA 2014	28	46	95	0	1	8	12	**190**
FA 2015	32	42	96	0	0	10	10	**190**
FA 2016	43	38	87	0	0	8	11	**187**

Enrollment by Gender: Majors (1.a.3.5)



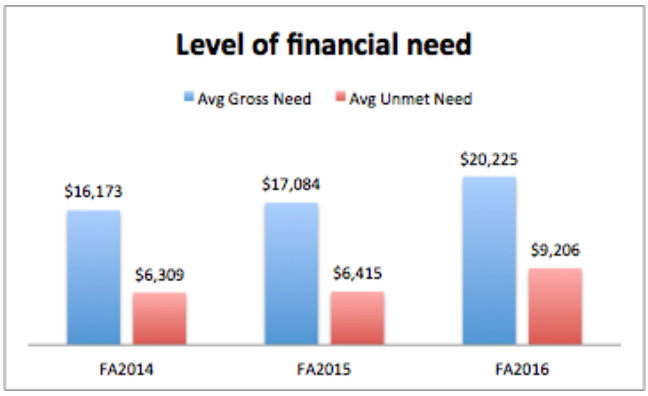
Enrollment by Gender: All Undergraduates



UG Enrollment by Gender					
Term	**Female**	**Male**	**Total**	**Female**	**Male**
FA 2014	31	159	**190**	16%	84%
FA 2015	38	152	**190**	20%	80%
FA 2016	44	143	**187**	24%	76%

Level of Financial Need (1.a.3.6)

Level of Financial Need									
Academic Program	FA 2014	FA 2014	FA 2014	FA 2015	FA 2015	FA 2015	FA 2016	FA 2016	FA 2016
	Students	Avg Gross Need	Avg Unmet Need	Students	Avg Gross Need	Avg Unmet Need	Students	Avg Gross Need	Avg Unmet Need
Physics(BS)	170	$16,173	$6,309	165	$17,084	$6,415	153	$20,225	$9,206



A4 Degree Requirements from Undergraduate Catalog (1.a.3.8.a)

3460 Physics

Programs Offered:

Bachelor of Science in Physics
- Standard Program in Physics:

- **Concentration in Applied Physics**
- **Concentration in Astronomy**
- **Concentration in Pre-Medicine**
- **Concentration in Biophysics**
- **Concentration in Geology**
- **Concentration in Computer Science**
- **Concentration in Education**

- Dual Degree Programs: B.S. Physics with the M.A.T. Science Education
- Minor in Physics

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D. Michael Crenshaw, Chair
Brian Thoms, Associate Chair and Undergraduate Director in Physics
Sumith Doluweera, Undergraduate Director in Physics – Lower Division Courses
Ben McGimsey, Undergraduate Director in Astronomy

All degree programs described below are built on a core of 21 semester hours of physics numbered 3300 or above and 4 semester hours of mathematics. The standard program is designed to prepare the student for graduate school or immediate employment upon graduation. Students selecting the standard program must complete 21 semester hours of physics, astronomy and mathematics beyond the core set of physics and mathematics courses listed below. As an alternative to the standard program, courses in one of several specific areas of concentration may be chosen as described below. The available areas of concentration are applied physics, astronomy, pre-medicine, biophysics, geology, computer science, and education.

A central objective of Georgia State University is that all graduates from its programs will be proficient in writing, critical and analytical thinking, and use of information resources. In support of this objective, the Department of Physics and Astronomy explicitly incorporates activities to develop these skills as appropriate in each course.

To schedule an effective program of study, it is very important that all students intending to major in physics consult with the physics faculty adviser as soon as possible. Physics majors are strongly encouraged to complete PHYS 1000 in their first or second semester. PHYS 1000 is also appropriate for students considering physics and astronomy. Physics majors should pay special attention to the early completion of the mathematical requirements if they are to complete their physics requirements during the usual four-year span. The first calculus course should be taken during the freshman year, and the second and third calculus courses should be completed during the sophomore year. The department recommends that General Chemistry I and II be taken during the freshman year. The beginning physics sequence (PHYS 2211K–PHYS 2212K) should be completed before the end of the sophomore year. Students who enter the physics major after completing a non-calculus level elementary physics sequence should consult with their departmental adviser on the best method of preparing for more advanced courses in physics.

Academic Advisement for Undergraduate Students

Academic advisement for undergraduate students is provided through the University Advisement Center (freshman through junior status/fewer than 90 hours) and the college's Office of Academic Assistance (senior status/90 or more hours). See section 3040 for additional information.

B.S. in Physics

Program Degree Requirements

In addition to the Program Degree Requirements, students must fulfill the College of Arts and Sciences Degree Requirements (see section 3030) and the University Degree Requirements (see section 1400).

Area A:

Required course: MATH 1112, MATH 1113, or higher level MATH must be taken in Area A. A section of MATH 1113 Precalculus that is designated specifically for this major is recommended (see GoSolar listing to identify appropriate sections).

Areas D:

Required course: MATH 2211 Calculus of One Variable I (4) (or a higher-level mathematics course)

Recommended courses: CHEM 1211K Principles of Chemistry I (4) and CHEM 1212K Principles of Chemistry II (4)

Area F: Courses Appropriate to the Major (18)

1. Required Courses (Unless used to satisfy Area D requirements) (18):
PHYS 1000 Gateway to Physics (2) (Not required of student entering with an AS degree)
PHYS 2211K Principles of Physics I (4) and PHYS 2212K Principles of Physics II (4)
CHEM 1211K Principles of Chemistry I (4) and CHEM 1212K Principles of Chemistry II (4)
MATH 2212 Calculus of One Variable II (4)
MATH 2215 Multivariate Calculus (4)

2. Select additional elective courses from the following to complete 18 hours in Area F:
CSC 1301 Principles of Computer Science I (4)
CSC 1302 Principles of Computer Science II (4)
ASTR 1010K Astronomy of the Solar System (4)
ASTR 1020K Stellar and Galactic Astronomy (4)
BIOL 1103K Introductory Biology I (4)
BIOL 1104K Introductory Biology II (4)
BIOL 2107K Principles of Biology I (4)
BIOL 2108K Principles of Biology II (4)
GEOL 1121K Introductory Geology I (4)
GEOL 1122K Introductory Geology II (4)
EDUC 2110 Investigating Critical and Contemporary Issues in Education (3)
EDUC 2120 Exploring Socio-Cultural Perspectives on Diversity in Educ. Contexts (3)
EDUC 2130 Exploring Learning and Teaching (3)
RSCH 1203 Research Strategies and Technology (1)

Students should choose courses appropriate to their intended concentration. Consult the Undergraduate Director for the BS in Physics for advice.
All courses above ending in K are commonly offered as separate lecture and lab (L) courses by GSU's Perimeter College. The combined (K) courses and separate lecture and lab (L) courses cover the same subject matter and are considered equivalent courses.
Any credit hours exceeding 18 earned to complete the Area F requirements will count toward elective hours.

Area G: Major Courses

A grade of C or higher is required in all major courses. The Department of Physics and Astronomy offers several concentrations within the B.S. in Physics degree program. The standard program is recommended for those who plan to pursue graduate study in physics. Other options include concentrations in applied physics, astronomy, pre-medicine, biophysics, geology, computer science, and education. Course requirements listed below for each of the options are in addition to the courses listed under Area F and the required lower division courses listed above. The standard program and all concentrations are centered on the 21-hour core of physics courses and the four-hour core of mathematics courses listed below.

Physics and Mathematics Core (25)

1. Required Courses to Fulfill CTW Requirement (6):
PHYS 3300 Advanced Physics Laboratory-CTW (3)
PHYS 4900 Research Project-CTW (3)

2. Additional Physics Requirements (15):
PHYS 3401 Modern Physics I (4)
PHYS 3850 Statistical and Thermal Physics (3)
PHYS 4600 Classical Mechanics (4)
PHYS 4700 Electricity and Magnetism (4)

3. Mathematics Requirements (4):
MATH 2652 Differential Equations (4)

Standard Program in Physics (21)

To meet the requirements for the degree with the standard program, the core set of physics and mathematics courses must be completed along with additional physics and mathematics courses as described below:

1. Required courses (9):
PHYS 3402 Modern Physics II (3)
MATH 4258 Vector Calculus (3)
MATH 4265 Partial Differential Equations (3)

2. Physics and Astronomy Courses (9): Select nine hours from the following.
PHYS 3500 Electronics (3)
PHYS 3550 Mathematical Methods and Computational Physics I (3)
PHYS 3560 Mathematical Methods and Computational Physics II (3)
PHYS 3800 Optics (4)
PHYS 4110 Introduction to Embedded Systems Laboratory (4)
PHYS 4340 Neurophysics (3)
PHYS 4410 Nuclear and Particle Physics (3)
PHYS 4500 Special Topics in Physics (3)
PHYS 4710 Functional Neuroimaging (3)
PHYS 4810 Quantum Mechanics (3)
PHYS 4910 Solid State Physics (3)
PHYS 4720 Introduction to Magnetism and Magnetic Materials (3)
PHYS 4950 Advanced Research (1-3)
ASTR 3500 Quantitative Astronomy (4)
ASTR 3510 Astrophysics of Stars and Planets (3)
ASTR 3520 Galactic and Extragalactic Astrophysics (3)
ASTR 4100 Astronomical Techniques and Instrumentation (3)

3. Mathematics and Computer Science Courses (3): Select one course.
CSC 4610 Numerical Analysis I (3)
MATH 2641 Linear Algebra I (3)
MATH 4250 Complex Analysis (3)

Applied Physics Concentration (21)

In addition to the core courses in physics and mathematics, the applied physics concentration allows courses from other sciences and engineering to complete the program in physics-related areas. Engineering courses may be available through cross registration at the Georgia Institute of Technology. At least 18 semester hours must be completed at the 3000 level or above, and at least nine semester hours must be selected from science and/or engineering courses offered by other departments. **The overall program must be developed in consultation with a faculty advisor within the Department of Physics and Astronomy.**

Astronomy Concentration (21)

In addition to the core set of physics and mathematics courses, the astronomy concentration consists of 12 semester hours in astronomy courses (ASTR 3510, ASTR 3520, ASTR 4000, and ASTR 4100), and others from the list below, to complete the requirements for the degree.

1. Required courses (12):
ASTR 3510 Astrophysics of Stars and Planets (3)
ASTR 3520 Galactic and Extragalactic Astrophysics (3)
ASTR 4100 Astronomical Techniques and Instrumentation (3)
ASTR 4200 Applications in Modern Astronomy (3)

2. Physics, Mathematics, and Computer Science Courses (9):
Select eleven hours from the following or other courses approved by the undergraduate director.
PHYS 3402 Modern Physics II (3)
PHYS 3500 Electronics (3)
PHYS 3550 Mathematical Methods and Computational Physics I (4)
PHYS 3560 Mathematical Methods and Computational Physics II (4)
PHYS 3800 Optics (4)
PHYS 4110 Introduction to Embedded Systems Laboratory (4)
PHYS 4340 Neurophysics (3)
PHYS 4410 Nuclear and Particle Physics (3)
PHYS 4500 Special Topics in Physics (3)
PHYS 4710 Functional Neuroimaging (3)
PHYS 4720 Introduction to Magnetism and Magnetic Materials (3)
PHYS 4810 Quantum Mechanics (3)
PHYS 4910 Solid State Physics (3)
PHYS 4950 Advanced Research (1-3)

CSC 4610 Numerical Analysis I (3)
MATH 2641 Linear Algebra I (3)
MATH 4250 Complex Analysis (3)
MATH 4258 Vector Calculus (3)
MATH 4265 Partial Differential Equations (3)

Pre-Medicine Concentration (21)

In addition to the core set of physics and mathematics courses, the pre-medicine concentration allows courses from biology and chemistry to complete the requirements for the degree. The concentration also provides the set of physics, chemistry, and biology courses required for admission to most medical schools. Note that BIOL 2107K and BIOL 2108K are prerequisites for BIOL 3800 and other upper-division biology courses.

1. Required Chemistry courses (8):
CHEM 2400 Organic Chemistry I (3)
CHEM 2410 Organic Chemistry II (3)
Select one of the following options (2):
CHEM 2400L Organic Chemistry Laboratory I (1) and CHEM 2410L Organic Chemistry Laboratory II (1)
CHEM 2100 Intermediate Organic Chemistry Laboratory (2)

2. Required Biology course (3): Select one of the following.
BIOL 3240 Human Physiology (3)
BIOL 3800 Molecular Cell Biology (3)

3. Electives (10):
Select ten hours from the following or other courses approved by the undergraduate director.
BIOL 3240 Human Physiology (3) (unless used above)
BIOL 3250 Human Physiology Laboratory (1)
BIOL 3800 Molecular Cell Biology (3) (unless used above)
BIOL 3810 Molecular Cell Biology Laboratory-CTW (3)
BIOL 3880 Microbiology (3)
BIOL 3890 Microbiology Laboratory (1)
BIOL 3900 Genetics (3)
BIOL 3910 Genetics Laboratory (1)
CHEM 3400 Intermediate Organic Chemistry (3)
CHEM 3110 Intermediate Organic Chemistry Laboratory II (2)
CHEM 4600 Biochemistry I (5)
NEUR 3000 Principles of Neuroscience (4)
NEUR 3010 Neuroscience Laboratory (4)
NEUR 4030 Computational Neuroscience (4)
PHYS 4340 Neurophysics (3)

PHYS 4710 Functional Neuroimaging (3)
MATH 4258 Vector Calculus (3)
MATH 4265 Partial Differential Equations (3)

Biophysics Concentration (21)

In addition to the core set of physics and mathematics courses, the biophysics concentration allows biology and chemistry courses to complete the requirements for the degree. The courses should be chosen from the list below and provide background in several areas including biochemical, biomolecular, and neural sciences. This concentration provides excellent preparation for advanced study in biological physics and for admission to M.D./Ph.D. programs. Note that Biol 2107K and 2108K are prerequisites for Biol 3800 and other upper-division biology courses.

1. Required courses (6):
BIOL 3800 Molecular Cell Biology (3)
CHEM 2400 Organic Chemistry I (3)

2. Electives (15):
Select 15 hours from the following or other courses approved by the undergraduate director. Note that CHEM 2410, Organic Chemistry II, is a prerequisite for many other courses listed.

CHEM 2400L Organic Chemistry Laboratory I (1)
CHEM 2410L Organic Chemistry Laboratory II (1)
CHEM 2100 Intermediate Organic Chemistry Laboratory (2)
CHEM 2410 Organic Chemistry II (3)
CHEM 3400 Intermediate Organic Chemistry (3)
CHEM 3110 Intermediate Organic Chemistry Laboratory II (2)
CHEM 4000 Fundamentals of Chemical Analysis-CTW (3)
CHEM 4110 Physical Chemistry I (3)
CHEM 4120 Physical Chemistry II (3)
CHEM 4600 Biochemistry I (5)
BIOL 3810 Molecular Cell Biology Laboratory-CTW (3)
BIOL 3840 Animal Biology (3)
BIOL 3850 Animal Biology Laboratory (1)
BIOL 3880 Microbiology (3)
BIOL 3890 Microbiology Laboratory (1)
BIOL 3900 Genetics (3)
BIOL 3910 Genetics Laboratory (1)
BIOL 4102 Neurobiology (4)
NEUR 3000 Principles of Neuroscience (4)
NEUR 3010 Neuroscience Laboratory (4)
NEUR 4030 Computational Neuroscience (4)
PHYS 3402 Modern Physics II (3)
PHYS 3500 Electronics (3)

PHYS 4340 Neurophysics (3)
PHYS 4710 Functional Neuroimaging (3)
MATH 4258 Vector Calculus (3)
MATH 4265 Partial Differential Equations (3)

Geology Concentration (21)

In addition to the core set of physics and mathematics courses, this concentration allows geology courses to complete the requirements for the degree. The courses should be chosen from the list below. Note that GEOL 1121K and GEOL 1122K are prerequisites for upper-division geology courses.

1. Geology Courses (15):
Select at least 15 hours from the following or other courses approved by the undergraduate director.

GEOL 3002 Introduction to Earth Minerals (4)
GEOL 4003 Aqueous Geochemistry (4)
GEOL 4005 Geology of Georgia (3)
GEOL 4007 Hydrogeology (4)
GEOL 4013 Structural Geology (4)
GEOL 4015 Crystallography and Optical Mineralogy (4)
GEOL 4016 Igneous and Metamorphic Petrology (4)
GEOL 4017 Environmental Geology (4)
GEOL 4030 X-Ray Methods and Techniques (4)

2. Electives (6):
Select at least six hours from the following or other courses approved by the undergraduate director.

PHYS 3402 Modern Physics II (3)
PHYS 3500 Electronics (3)
PHYS 3800 Optics (4)
PHYS 4110 Introduction to Embedded Systems Laboratory (4)
PHYS 4340 Neurophysics (3)
PHYS 4410 Nuclear and Particle Physics (3)
PHYS 4710 Functional Neuroimaging (3)
PHYS 4720 Introduction to Magnetism and Magnetic Materials (3) |
PHYS 4810 Quantum Mechanics (3)
PHYS 4910 Solid State Physics (3)
PHYS 4950 Advanced Research (1-3)
CSC 4610 Numerical Analysis I (3)
MATH 2641 Linear Algebra I (3)
MATH 4250 Complex Analysis (3)
MATH 4258 Vector Calculus (3)
MATH 4265 Partial Differential Equations (3)

Computer Science Concentration (21)

In addition to the core set of physics and mathematics courses, this option allows courses in computer science and related areas to complete the requirements for the degree. The courses should be chosen from the list below. Note that one or more of CSC 1301, CSC 1302, CSC 2510, and CSC 2720 are prerequisites for many upper-division computer science courses.

1. Required Physics course (3):
   PHYS 3500 Electronics (3)

2. Computer Science Courses (12):
   Select 12 hours of courses from the following or other courses approved by the undergraduate director.

   CSC 3210 Computer Organization and Programming (3)
   CSC 3320 System Level Programming (3)
   CSC 3330 C++ Programming (3)
   CSC 4120 Introduction to Robotics (4)

   CSC 4210 Computer Architecture (4)
   CSC 4220 Computer Networks (3)
   CSC 4310 Parallel and Distributed Computing (4)
   CSC 4330 Programming Language Concepts (3)
   CSC 4520 Design and Analysis of Algorithms (4)
   CSC 4610 Numerical Analysis I (3)
   CSC 4620 Numerical Analysis II (3)
   CSC 4630 Introduction to Matlab Programming (4)
   CSC 4730 Data Visualization (4)
   CSC 4820 Interactive Computer Graphics (4)

3. Electives (6):
   Select six hours from the following or other courses approved by the undergraduate director.

   PHYS 3402 Modern Physics II (3)
   PHYS 3800 Optics (4)
   PHYS 4110 Introduction to Embedded Systems Laboratory (4)
   PHYS 4410 Nuclear and Particle Physics (3)
   PHYS 4340 Neurophysics (3)
   PHYS 4410 Nuclear and Particle Physics (3)
   PHYS 4710 Functional Neuroimaging (3)
   PHYS 4810 Quantum Mechanics (3)
   PHYS 4910 Solid State Physics (3)
   PHYS 4950 Advanced Research (1-3)
   MATH 2641 Linear Algebra I (3)

MATH 3030 Mathematical Models for Computer Science (3)
MATH 4250 Complex Analysis (3)
MATH 4258 Vector Calculus (3)
MATH 4265 Partial Differential Equations (3)

Education Concentration (21)

In addition to the core set of physics and mathematics courses, this option leads to certification to teach physics in grades 6-12. Prior to beginning this concentration, students must be accepted into Teacher Education in the College of Education and Human Development. To apply, students must have: completed Areas A-F of the program of study, earned a 2.5 overall cumulative GPA, passed [Combined Test I, II, and III (700)] or been exempted from the GACE Program Admission Assessment. When registering for the assessment, program entry candidates must add your program provider (Georgia State University – school code 5090) as a score recipient when you register or we will not receive notification that you have completed the assessment; and Completed the Georgia Educator Ethics – Program Entry (350) Assessment; though there is no "Pass/Fail" grade assigned. Program entry candidates must add your program provider (Georgia State University) as a score recipient when you register or we will not receive notification that you have completed the assessment.

Note that EDUC 2110, EDUC 2120, and EDUC 2130 are prerequisites for the field placement courses (EDCI 4600, EDCI 4650, and EDCI 4750).

1. Required courses (21):
EXC 4020 Characteristics and Instructional Strategies for Students with Disabilities (3)
EDSC 4655 Principles of Science Instruction (3)
EDSC 4755 Theory and Pedagogy of Science Instruction (3)
EDCI 3250 Introduction to Teaching in Secondary Schools (3)
EDCI 4600 Practicum (3)
EDCI 4650 Opening School Experience (0)
EDCI 4750 Student Teaching in the Secondary Schools (6)

2. Additional requirements for teacher certification:
Students must maintain a 3.00 GPA for courses in the education concentration.
Only hours of EDCI 4600 and EDCI 4750 completed with a grade of B or better will count toward certification.
Students must pass appropriate GACE II examination to be recommended for certification. Each student will be required to maintain an electronic program portfolio and to demonstrate proficiency in the pedagogy standards from the Interstate New Teacher Assessment and Support Consortium (INTASC) and the content standards from the National Science Education Standards (NSES). Requirements for the INTASC standards and the National Educational Technology Standards (NETS) will be embedded in the coursework listed above.

Pre-Service Certificate: Upon admission to a teacher education program, students will be contacted by the college advisement/admissions office and provided with instructions to claim enrollment in their program and submit a GaPSC Pre-Service Certificate Application. The pre-service certificate is required for placement in required field experiences or clinical practice.

Georgia Assessments for the Certification of Educators (GACE): The state of Georgia requires such candidates to take various GACE and Educator Ethics assessments as part of the educator certification process. These computer-delivered assessments have been developed by the Georgia Professional Standards Commission (GaPSC) and are delivered by the Education Testing Service (ETS). You will take these tests at different times.

Program Admission and Content Assessments: Program Admission Assessment [Combined Test I, II, and III (700)] is an admission requirement (unless candidate meets qualifications for exemption – scroll down to "Options to Satisfy the Program Admission Assessment Requirement"). When registering for the assessment, program entry candidates must add your program provider (Georgia State University – school code 5090) as a score recipient when you register or we will not receive notification that you have completed the assessment.

Content Assessment (different content assessments for each program) tests your content knowledge and is taken after enrollment and prior to program completion. You will receive specific information regarding this test as you near completion of your program (required for certification).

Georgia Educator Ethics Assessment: Georgia Educator Ethics – Program Entry (350) Assessment is an admission requirement. Completion of this assessment is required for admission, though there is no "Pass/Fail" grade assigned. Program entry candidates must add your program provider (Georgia State University) as a score recipient when you register or we will not receive notification that you have completed the assessment.

edTPA: edTPA is a preservice assessment process designed by educators to answer the essential question: "Is a new teacher ready for the job?" edTPA includes a review of a teacher candidate's authentic teaching materials as the culmination of a teaching and learning process that documents and demonstrates each candidate's ability to effectively teach his/her subject matter to all students.

edTPA is a program completion and teacher certification requirement. Students may graduate from the BIS program while continuing to complete teacher certification requirements for edTPA.

Area H: Minor and/or Additional Courses

1. Students earning a B.S. through the Department of Physics and Astronomy are not required to take a minor.

2. Additional courses must be taken as electives to complete a minimum of 120 semester hours, exclusive of KH 1010. Although not a requirement, the department recommends that physics majors take these elective courses at the 2000 level or above in mathematics, computer science, chemistry, biology, geology, physics, or astronomy. (Consult with the departmental academic adviser.)

B.S. Physics / M.A.T. Science Education Dual Degree Program

This dual degree program, allowing completion of both degrees and teacher certification requirements in approximately 5 years, is available to undergraduates majoring in physics who have completed at least 30 hours of academic credit (including MATH 2211 and PHYS 2211K) and who have earned a minimum cumulative GPA of 3.3. Students may apply to the option at any time after completing 30 hours but prior to completing 90 hours of undergraduate coursework. Applicants are applying for early acceptance into the College of Education and Human Development's MAT program and therefore must submit the following documentation in addition to meeting the GPA requirement:

Complete the BS/MAT pre-application form. This will be kept on file in the Department of Physics & Astronomy and in the Office of Academic Assistance in the College of Arts & Sciences. 2-3 letters of recommendation: (a) one academic or professional letter; (b) one letter from someone who can evaluate the applicant's personal qualifications, experience, and background in light of potential to work successfully with adolescents; (c) one letter from a current work supervisor, if applicable
Documentation of previous work experience (résumé or curriculum vitae)
Personal statement of goals and/or reasons for teaching
Successful interview with appropriate program faculty in the Department of Physics and Astronomy and in the College of Education and Human Development

Final acceptance into the M.A.T. portion of the program will be contingent upon the following:

Maintaining a cumulative GPA of 3.0 or higher;
Completion of 90 hours towards the B.S. degree in Physics (including Phys 7460 and Phys 7850); Submission of acceptable GRE scores;
Filing an application to the M.A.T. program by the appropriate deadline.

Acceptance into the Teacher Education track is contingent upon acceptance into the M.A.T. portion, completion of 24 hours in physics, and passing or exempting the GACE Basic Skills test.

Students in this program will select one of the B.S. concentrations listed above. The curriculum allows students to satisfy the content requirement of the M.A.T. program by enrolling in the 7000-level counterparts of the core physics courses (PHYS 7850 for PHYS 3850, Phys 7460] for PHYS 3401, Phys 7600] for PHYS 4600, and Phys 7700] for PHYS 4700). In addition, to meet the M.A.T. and teacher certification requirements,

students will enroll in EXC 4020 and 6 hours of graduate-level courses required for the M.A.T. in satisfying 9 hours of elective credits towards the B.S. in Physics.

Normally, students in their 4th year are enrolled in both the B.S. and the M.A.T. programs and will receive the B.S after the 4th year. In the 5th year, students will take professional education courses (24 hours) and will focus on the student teaching requirements.

For more information on this program's curriculum, please contact the Department of Physics and Astronomy. The M.A.T. requirements for Science Education are described more fully in the College of Education and Human Development section of the Graduate Catalog.

Minor in Physics

Students who wish to minor in physics must take at least 15 semester hours in physics and/or astronomy courses, including at least nine semester hours at the 3000 level or above. Students taking more than 15 semester hours in these courses may count the additional hours toward their electives or may consider completing a double major. A grade of C or higher is required in all courses counting toward the minor.

Graduation with distinction

To qualify for Graduation with Distinction in Physics, students need a minimum grade-point average of 3.4 for all their GSU courses, plus a minimum grade-point average of 3.4 for all courses taken for their major, plus a grade of either A or A+ in the course PHYS 4900 Research Project-CTW.

A5 Course descriptions from the Undergraduate Catalog (1.a.3.8.b)

ASTR 1000	Introduction to the Universe
Credit Hours	3.0
Description	Three lecture hours a week. A survey of the universe, examining the historical origins of astronomy; the motions and physical properties of the Sun, Moon, and planets; the formation, evolution, and death of stars; and the structure of galaxies and the expansion of the universe.

ASTR 1010	Astronomy of the Solar System
Credit Hours	3.0
Corequisites	ASTR 1010L
Description	Astronomy from early ideas of the cosmos to modern observational techniques. The solar system planets, satellites, and minor bodies. The origin and evolution of the solar system.

ASTR 1010K	Astronomy of the Solar System
Credit Hours	4.0
Description	Astronomy from early ideas of the cosmos to modern observational techniques. The solar system planets, satellites, and minor bodies. The origin and evolution of the solar system. Includes a laboratory component.

ASTR 1010L	Astronomy Of The Solar Sys Lab
Credit Hours	1.0
Prerequisites	Exit or exemption from MATH 0997, ENGL 0999, and all ESL requirements except ENSL 0091
Description	This is the laboratory to accompany [ASTR 1010].

ASTR 1020	Stellar and Galactic Astronomy
Credit Hours	3.0
Prerequisites	ASTR 1010 and ASTR 1010L with a D or better

Corequisites	ASTR 1020L
Description	The study of the Sun and stars, their physical properties and evolution, interstellar matter, star clusters, our galaxy and other galaxies, and the origin and evolution of the universe

ASTR 1020K	**Stellar and Galactic Astronomy**
Credit Hours	4.0
Prerequisites	Astr1010K or Astr1010 and Astr1010L with grades of D or higher
Description	The study of the Sun and stars, their physical properties and evolution, interstellar matter, star clusters, our galaxy and other galaxies, and the origin and evolution of the universe. Includes a laboratory component.

ASTR 1020L	**Stellar and Galactic Astronomy Laboratory**
Credit Hours	1.0
Prerequisites	ASTR 1010 and ASTR 1010L with a D or better
Corequisites	ASTR 1020
Description	This is the laboratory to accompany [ASTR 1020].

ASTR 1500	**Life in the Universe**
Credit Hours	3.0
Description	The course examines the possibility of life in the Universe beyond Earth. Techniques used to explore environments potentially suitable for life in our Solar System, as well as to discover and characterize thousands of planets orbiting other stars will be discussed. Connections to organisms surviving extreme environments on Earth will provide context for the many possibilities of life on other worlds. Three lecture hours a week.

ASTR 3010	**Topics in Modern Astronomy**
Credit Hours	3.0
Prerequisites	ASTR 1020 with grade of D or higher, or equivalent
Description	Three lecture hours a week. Pulsars, quasars, black holes, x-ray sources, UV astronomy, IR astronomy, radio galaxies, interstellar molecules, 3K background radiation, manned and unmanned planetary exploration.

ASTR 3500	Quantitative Astronomy
Credit Hours	4.0
Prerequisites	PHYS 2212K with grade of C or higher, or consent of instructor
Description	Four lecture hours a week. An intermediate-level course that uses the tools of calculus-based physics to explore the properties of planets, stars, galaxies, and the Universe.

ASTR 3510	Astrophysics of Stars and Planets
Credit Hours	3.0
Prerequisites	PHYS 2212K with a C or higher, or consent of instructor
Description	This class is the first of a two-semester sequence designed to provide a technical introduction to the modern science of astronomy and astrophysics. Topics will include a survey of astronomical tools and methods, and a discussion of stars and planetary systems. To teach this course, the instructor will rely on calculus based physics to explain the motions and properties of celestial objects. Three lecture hours a week.

ASTR 3520	Galactic and Extragalactic Astrophysics
Credit Hours	3.0
Prerequisites	ASTR 3510 with a C or higher
Description	The class is the second of a two-semester sequence designed to provide a technical introduction to the modern science of astronomy and astrophysics. Topics will include a discussion of galaxies and other large-scale structures in the Universe. To teach this course, the instructor will rely on calculus based physics to explain the motions and properties of celestial objects. Three lecture hours a week.

ASTR 4100	Astronomical Techniques and Instrumentation
Credit Hours	3.0
Prerequisites	PHYS 2212K with grade of C or higher, or consent of instructor
Description	Three lecture hours a week. Fundamental and practical application of imaging, spectroscopy, photometry, astrometry, interferometry, and current developments in detector technology and telescope design.

ASTR 4200	Applications in Modern Astronomy
Credit Hours	3.0
Prerequisites	PHYS 3401 and ASTR 3510 with a C or higher
Description	Three lecture hours a week. This course presents an overview of modern astrophysical phenomena with an introduction to astronomical databases, plotting tools, data manipulation and visualization, and numerical analysis techniques. The course will emphasize data-driven problem solving, hands-on computational skills, and critical thinking. Cross-listed with [ASTR 6200].

ASTR 4500	Special Topics in Astronomy and Astrophysics
Credit Hours	3.0
Prerequisites	consent of instructor
Description	Topics of special interest in astronomy and astrophysics as may fit the needs and interests of students and faculty. Topics may be in the fields of planetary astronomy, exoplanets, astrobiology, stellar and galactic astronomy, extra-galactic astronomy, and cosmology.

ASTR 4995	Directed Readings B.I.S.-CTW
Credit Hours	3.0 - 4.0
Description	Directed Readings designed for Bachelor of Interdisciplinary Studies students. This course may satisfy the junior and/or senior-level Critical Thinking Through Writing requirements.

PHYS 1000	Gateway to Physics
Credit Hours	2.0
Description	This is a seminar course intended for anyone curious about physics and its relevance to contemporary life. No background in physics is necessary. The course engages a broad spectrum of resources and experiential opportunities (e.g. popular science books & articles, videos, websites, lab tours, field trips, service learning opportunities, and guest presenters) to explore compelling interconnections between physics, other disciplines and career interests. Course topics may include Physics and the Human Body, Physics and the Nano-scale, Physics and the Cosmos, Physics and Technology, Physics and Art, and Chaos & Complexity.

PHYS 1111	Introductory Physics I
Credit Hours	3.0
Prerequisites	MATH 1112 or MATH 1113 with a grade of C or higher.
Corequisites	PHYS 1111L
Description	This introductory course is the first in a two course survey of the primary fields of physics. This course will include material from mechanics, thermodynamics, and Waves. Elementary algebra and trigonometry will be used.

PHYS 1111K	Introductory Physics I
Credit Hours	4.0
Prerequisites	MATH 1112 or MATH 1113 with grade of C or higher
Description	This introductory course is the first in a two-course survey of the primary fields of physics. This course will include material from mechanics, thermodynamics, and waves including a laboratory component. Elementary algebra and trigonometry will be used.

PHYS 1111L	Introductory Physics I Lab
Credit Hours	1.0
Corequisites	PHYS 1111

Description	This is a laboratory to accompany [PHYS 1111]. Assignments are designed to reinforce lecture concepts.

PHYS 1112	**Introductory Physics II**
Credit Hours	3.0
Prerequisites	PHYS 1111 and PHYS 1111L, each with a grade of C or higher
Corequisites	PHYS 1112L
Description	This course will include material from electromagnetism, light, and modern physics. Elementary algebra and trigonometry will be used.

PHYS 1112K	**Introductory Physics II**
Credit Hours	4.0
Prerequisites	PHYS 1111K or PHYS 1111 and PHYS 1111L or PHYS 2211K or PHYS 2211 and PHYS 2211L with grades of C or higher
Description	This introductory course is the second in a two-course survey of the primary fields of physics. This course will include material from electromagnetism, light, and modern physics including a laboratory component. Elementary algebra and trigonometry will be used.

PHYS 1112L	**Introductory Physics II Laboratory**
Credit Hours	1.0
Corequisites	PHYS 1112
Description	This is a laboratory to accompany [PHYS 1112]. Assignments are designed to reinforce lecture concepts.

PHYS 2030	**Physical Science: Physics of Music and Speech**
Credit Hours	3.0
Description	No science background required. Not accepted as a part of the requirements for a major or an allied field in physics. Physical characteristics of musical sound; applications to musical tones, scales, harmony, and acoustics; problems of recording, amplifying, transmitting, and reproducing sound.

PHYS 2211	Principles of Physics I
Credit Hours	3.0
Prerequisites	MATH 2201 or MATH 2211 with a grade of C or higher
Corequisites	PHYS 2211L
Description	This is the first in a calculus based two course survey of the primary fields of physics. This course will cover mechanics, waves, simple harmonic motion, and thermodynamics.

PHYS 2211K	Principles of Physics I
Credit Hours	4.0
Prerequisites	MATH 2211 or MATH 2201 with grade of C or higher
Description	This is the first in a calculus-based two-course survey of the primary fields of physics. This course will cover mechanics, waves, simple harmonic motion, and thermodynamics including a laboratory component.

PHYS 2211L	Principles Of Physics I Laboratory
Credit Hours	1.0
Corequisites	PHYS 2211
Description	This is a laboratory to accompany [PHYS 2211]. Assignments are designed to reinforce lecture concepts.

PHYS 2212	Principles of Physics II
Credit Hours	3.0
Prerequisites	Either MATH 2212 or MATH 2202; and PHYS 2211K or PHYS 2211 and PHYS 2211L with grades of C or higher
Corequisites	PHYS 2212L
Description	This is the second in a calculus based two course survey of the primary fields of physics. This course will cover electromagnetism, optics, and modern physics.

PHYS 2212K	Principles of Physics II

Credit Hours	4.0
Prerequisites	MATH 2212 or MATH 2202 and Phys2211K or Phys2211 and Phys2211L with grades of C or higher
Description	This is the second in a calculus-based two-course survey of the primary fields of physics. This course will cover electromagnetism, optics, and modern physics including a laboratory component.

PHYS 2212L	**Principles Of Physics II Laboratory**
Credit Hours	1.0
Corequisites	PHYS 2212
Description	This is a laboratory to accompany [PHYS 2212]. Assignments are designed to reinforce lecture concepts.

PHYS 2940	**Directed Laboratory Investigations**
Credit Hours	1.0 - 2.0
Prerequisites	consent of the department
Description	Directed laboratory investigation in physics involving the development of experimental skills required for advanced study in physics or a related science. May be repeated for no more than two hours total credit.

PHYS 3150	**Advanced General Physics**
Credit Hours	3.0
Prerequisites	a non-calculus elementary physics sequence such as PHYS 1111K and PHYS 1112K; MATH 2212 with grades of D or higher, or equivalent
Description	Three lecture hours a week. Not acceptable for credit for students who have had [Phys 2211K]-2212K. Designed to prepare the student who has completed a non-calculus-level elementary physics sequence for more advanced physics courses. The utilization of calculus in solving problems in classical physics is stressed.

PHYS 3300	**Advanced Physics Laboratory-CTW**
Credit Hours	3.0
Prerequisites	PHYS 2212 and MATH 2215 with grades of C or higher

Corequisites	PHYS 3401
Description	Advanced laboratory experiments in modern physics, optics, and astronomy with emphasis on scientific report writing. Required for all physics majors. Serves as one of the two Critical Thinking Through Writing (CTW) courses required of all physics majors.

PHYS 3401	**Modern Physics I**
Credit Hours	4.0
Prerequisites	PHYS 2212K and MATH 2215 with grade of C or higher
Description	Four lecture hours a week. Special relativity, quantum optics, wave and particle duality, Bohr theory, Schrodinger's quantum mechanics, one-electron atom, spin, and angular momentum.

PHYS 3402	**Modern Physics II**
Credit Hours	3.0
Prerequisites	PHYS 3401 with grade of C or higher
Description	Three lecture hours a week. Atomic spectra, X-ray spectra, nuclear structure, nuclear reactions, elementary particles, molecular spectra and structure, solid-state physics.

PHYS 3500	**Electronics**
Credit Hours	3.0
Prerequisites	PHYS 2212K with grade of C or higher, or consent of instructor
Description	Two lecture and four laboratory hours a week. Fundamentals of analog and digital circuit design; discrete and integrated circuit devices; electronic instrumentation.

PHYS 3550	**Mathematical Methods and Computational Physics I**
Credit Hours	3.0
Prerequisites	MATH 2215 and PHYS 2212K with a C or higher
Description	Examination of the mathematical methods most commonly used in Physics, and their application to the solution of fundamental physical problem through computer programming and simulations. This course will cover differential methods, Taylor series, complex numbers, vector

	calculus, probability and statistics, and their applications to Classical Mechanics, Electricity and Magnetism, and Statistical and Thermal Physics. Three lecture hours a week.

PHYS 3560	**Mathematical Methods and Computational Physics II**
Credit Hours	3.0
Prerequisites	MATH 2652 and PHYS 3550 with a C or higher
Description	Examination of the mathematical methods most commonly used in Physics, and their application to the solution of fundamental physical problem through computer programming and simulations. This course will cover linear algebra, Fourier series, differential equations, and their applications to Quantum Mechanics and complex physical systems. Three lecture hours a week.

PHYS 3800	**Optics**
Credit Hours	4.0
Prerequisites	PHYS 2212K with grade of C or higher
Description	Three lecture hours a week. Fundamentals and applications of optics: diffraction, interference, lasers, fiber optics, and applications of optical instrumentation. Three lecture hours and one two hour laboratory per week. Lectures cover fundamentals and applications of wave and ray optics: image formation, diffraction, interference, polarization, spectroscopy, lasers, fiber optics and applications of optical instrumentation. Laboratories will develop more fully topics covered in lectures.

PHYS 3850	**Statistical and Thermal Physics**
Credit Hours	3.0
Prerequisites	PHYS 2212K and MATH 2215 with grades of C or higher
Description	Three lecture hours a week. Physical statistics, quantum states and degeneracy, statistical definition of entropy, development of thermodynamics; applications to gases, radiation, and solids.

PHYS 4110	**Introduction to Embedded Systems Laboratory**
Credit Hours	4.0

Prerequisites	PHYS 3500 or CSC 3210 with grade of D or higher, or equivalent course work with consent of instructor
Description	(Same as [CSc 4110].) Four lecture hours per week. Topics taken from: review of basic logic functions; automatic systems; microprocessor- based systems and applications; embedded system software survey; digital communications; and embedded systems programming.

PHYS 4300	**Teaching Physics**
Credit Hours	1.0 - 2.0
Prerequisites	Consent of instructor
Description	Only open to students concurrently assisting with the teaching of a physics course. Two lecture hours per week. Course provides a theoretical and practical foundation for science teaching. Topics include univocal and dialogic discourse, questioning strategies, Blooms taxonomy, mental models, formative assessment and bridging, the resource framework, motivation and cooperative learning, argumentation, metacognition, nature of science, and qualities of effective teachers.

PHYS 4310	**Teaching Physics Practice**
Credit Hours	1.0
Prerequisites	Consent of instructor
Description	Only open to students concurrently assisting with the teaching of a physics course. One lecture hour per week. This course is designed to give students practice in teaching physics in an interactive manner. Students will work in teams to learn to give lectures and lead group activities.

PHYS 4340	**Neurophysics**
Credit Hours	3.0
Prerequisites	NEUR 3000 and PHYS 2212 with grades of B or higher, or equivalent, or consent of instructor
Description	Three lecture hours per week. Course provides fundamental findings of physics of neuronal systems. The course covers such topics as introduction to biomechanics, membranes, transport, electroosmotic effects, ion pumping, cellular homeostasis, the Hodgkin-Huxley formalism, energetics of spiking, neural coding, and dynamics of neurons and neuronal networks. It also covers methods of recording of neuronal activity.

PHYS 4410	Nuclear and Particle Physics
Credit Hours	3.0
Prerequisites	PHYS 3401 with grade of C or higher
Description	Three lecture hours a week. Properties of nuclei; nuclear models; nuclear reactions and radioactive decay processes; properties of elementary particles, their symmetries and interactions; standard model of elementary particles.

PHYS 4500	Special Topics in Physics
Credit Hours	3.0
Prerequisites	consent of instructor
Description	Topics of special interest in physics as may fit the needs and interests of undergraduate students and faculty. Topics may be in the fields of nuclear physics, nanophysics, solid state physics, optics and electronics, and neurophysics. May be repeated if topics are different.

PHYS 4510	Mathematics of Physics I
Credit Hours	3.0
Prerequisites	MATH 2215 with grade of C or higher
Description	(Same as [Math 4258].) Three lecture hours a week. Algebra of vectors, vector calculus, divergence, gradient, curl, line integrals, surface integrals, divergence theorem of Gauss, Stokes's theorem, conservative fields, orthogonal curvilinear coordinates, matrices, and Eigen value problems.

PHYS 4520	Mathematics of Physics II
Credit Hours	3.0
Prerequisites	MATH 2652 with a grade of C or higher
Description	(Same as [MATH 4265].) Three lecture hours a week. Derivation and solution of partial differential equations of physics, wave equation, LaPlaces equation, Schroedingers equation, special functions of mathematical physics, Fourier series, Sturm-Liouville system, complex analysis, and integration.

PHYS 4600	Classical Mechanics
Credit Hours	4.0
Prerequisites	PHYS 2212K and MATH 2652 with grades of C or higher, or equivalent, or consent of instructor
Description	Four lecture hours a week. Vector algebra, Newton's laws, conservation laws, many body systems, motion in central fields, small oscillations, motion in electromagnetic fields, rotation of rigid bodies, Lagrangian equations, Hamilton's principle, and virtual work.

PHYS 4700	Electricity and Magnetism
Credit Hours	4.0
Prerequisites	PHYS 2212K and MATH 2215 with grades of C or higher
Description	Four lecture hours a week. Electrostatics, steady currents, magnetic fields, magnetic induction, AC circuits, dielectrics, magnetic properties of matter, Maxwell's equations, and wave propagation.

PHYS 4710	Functional Neuroimaging
Credit Hours	3.0
Prerequisites	consent of instructor
Description	Three lecture hours a week. Foundations of physics principles applied to brain processes, different imaging modalities, and neuroimaging data analysis methods. Topics include physiological basis of functional neuroimaging, physics of different imaging modalities (fMRI, PET, EEG, MEG, fNIR, TMS), experimental design, neuroimaging data analysis, and applications in cognitive neuroscience. This course is appropriate for students majoring in physics, chemistry, biology, neuroscience, psychology, mathematics, statistics, and computer science with an interest in the use of functional neuroimaging.

PHYS 4720	Introduction to Magnetism and Magnetic Materials
Credit Hours	3.0
Prerequisites	PHYS 3401 and MATH 2652 with grades of C or higher
Description	Fundamentals of magnetism in solids, nanostructures and ferrofluids. Wide range of topics overviewing basic physics phenomena observed in magnetic materials and nanostructures will be covered, including static

	and dynamic phenomena, nanostructures and their applications in electronics and spintronics, ferrofluids, and the experimental approaches used to study magnetic phenomena.

PHYS 4810	**Quantum Mechanics**
Credit Hours	3.0
Prerequisites	PHYS 3401 and MATH 2652 with grades of C or higher, or consent of instructor
Description	Three lecture hours a week. Schrodinger's theory of quantum mechanics; solutions of Schrodinger's equation; perturbation theory; one-electron atoms; magnetic moments, spin, and relativistic effects; identical particles; multi-electron atoms.

PHYS 4900	**Research Project-CTW**
Credit Hours	3.0
Prerequisites	PHYS 3300 and PHYS 3401 with grades of C or higher and permission of the instructor
Description	Research Project in physics, astronomy, or a related field including preparation of a written and an oral report. Projects are performed under mentoring of a faculty member. Written reports are developed under the guidance of course coordinator. Required for all physics majors. Serves as one of the two Critical Thinking Through Writing (CTW) courses required of all physics majors. This course may include a Signature Experience component.

PHYS 4910	**Solid State Physics**
Credit Hours	3.0
Prerequisites	PHYS 3401 with grade of C or higher, or equivalent or consent of instructor
Description	Three lecture hours a week. Atoms in crystals (crystal structure); waves in crystals; crystal binding, lattice constants; lattice vibrations and other thermal properties of solids, free electrons in crystals, energy bands, and semiconductors.

PHYS 4950	Advanced Research
Credit Hours	1.0 - 3.0
Description	Faculty-led research group including training in techniques of advanced research in physics and astronomy and application of these techniques to research projects of current importance. May be repeated for a maximum of three credit hours. This course may include a Signature Experience component.

PHYS 4995	Directed Readings B.I.S.-CTW
Credit Hours	3.0 - 4.0
Description	Directed Readings designed for Bachelor of Interdisciplinary Studies students. This course may satisfy the junior and/or senior-level Critical Thinking Through Writing requirements.

A6 Course Enrollments

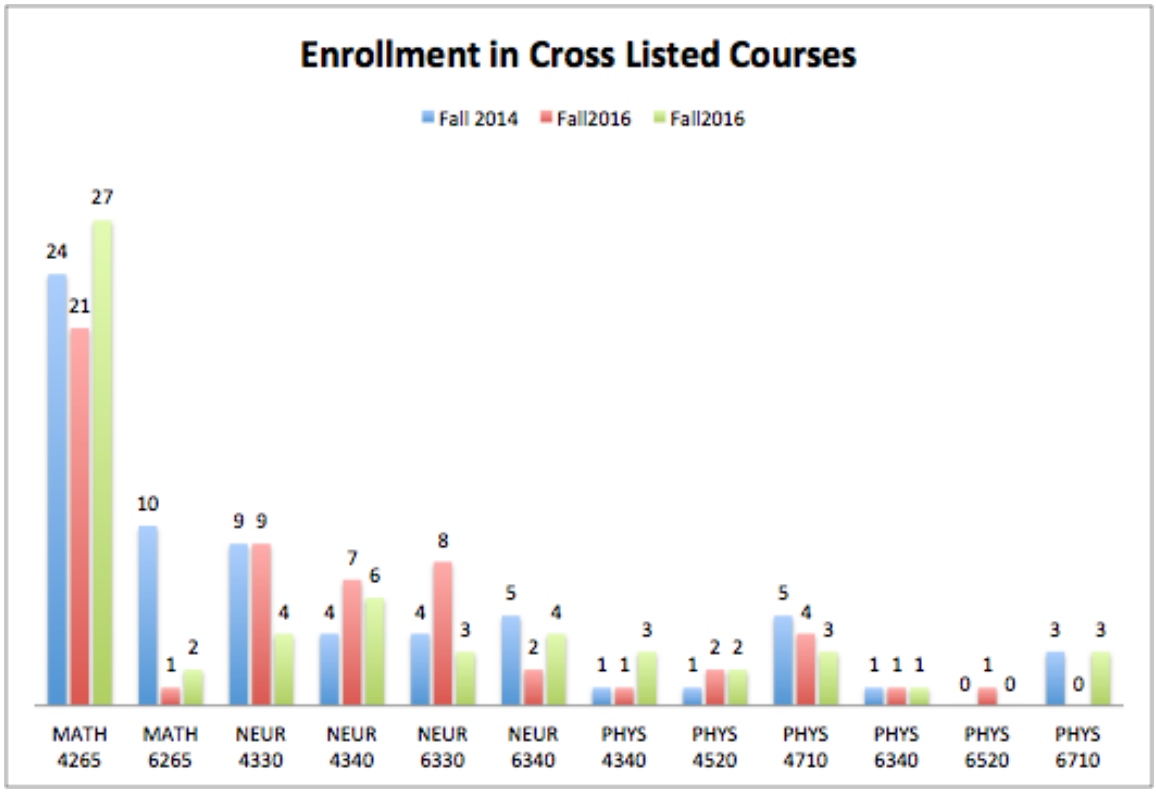
Course enrollment numbers, credit hours, sections for 2015 – 2017 (1.a.3.9)

		Heads			Hours			Sections			Hours/Sect		
Course	Level	15	16	17	15	16	17	15	16	17	15	16	17
ASTR 1000	LOWER	307	277	296	921	831	888	4	4	4	230	208	222
ASTR 1010	LOWER	811	751	776	3244	3004	3104	40	41	43	81	73	72
ASTR 1020	LOWER	668	643	604	2672	2572	2416	35	35	35	76	74	69
ASTR 3500	UPPER	16	0	17	64	0	68	1	0	1	64	0	68
ASTR 4000	UPPER	2	7	10	6	21	30	1	1	1	6	21	30
ASTR 4100	UPPER	6	7	6	18	21	18	1	1	1	18	21	18
ASTR 4999	UPPER	0	0	0	0	0	0	3	3	3	0	0	0
ISCI 2002	LOWER	102	102	120	306	306	360	3	3	3	102	102	120
NEUR 4330	UPPER	0	9	9	0	27	27	0	1	1	0	27	27
NEUR 4980	UPPER	0	0	1	0	0	5	0	0	1	0	0	5
NSCI 3001	UPPER	7	8	3	28	32	12	1	1	1	28	32	12
PHIL 1010	LOWER	0	0	89	0	0	178	0	0	3	0	0	59
PHYS 1000	LOWER	46	46	77	92	92	154	1	1	2	92	92	77
PHYS 1111	LOWER	683	650	653	2732	2600	2612	30	27	25	91	96	105
PHYS 1112	LOWER	566	578	512	2264	2312	2048	29	23	21	78	101	98
PHYS 2030	LOWER	36	27	37	108	81	111	2	2	2	54	41	56
PHYS 2211	LOWER	571	599	645	2284	2396	2580	30	31	33	76	77	78
PHYS 2212	LOWER	413	482	509	1652	1928	2036	25	27	31	66	71	66
PHYS 2940	LOWER	3	1	2	4	1	3	3	3	3	1	0	1
PHYS 3150	UPPER	1	1	0	3	3	0	3	3	3	1	1	0
PHYS 3300	UPPER	30	36	34	90	108	102	2	3	3	45	36	34
PHYS 3401	UPPER	34	37	30	136	148	120	1	1	1	136	148	120
PHYS 3402	UPPER	9	13	12	27	39	36	1	1	1	27	39	36
PHYS 3500	UPPER	0	23	0	0	69	0	0	1	0	0	69	0
PHYS 3800	UPPER	12	0	11	36	0	44	1	0	1	36	0	44
PHYS 3850	UPPER	34	28	22	102	84	66	1	1	1	102	84	66
PHYS 4300	UPPER	3	7	6	6	9	7	1	1	1	6	9	7
PHYS 4310	UPPER	0	0	7	0	0	7	0	0	1	0	0	7
PHYS 4410	UPPER	8	0	11	24	0	33	1	0	1	24	0	33
PHYS 4600	UPPER	25	27	28	100	108	112	1	1	1	100	108	112
PHYS 4700	UPPER	14	41	23	56	164	92	1	1	1	56	164	92
PHYS 4710	UPPER	5	4	3	15	12	9	1	1	1	15	12	9
PHYS 4810	UPPER	9	8	13	27	24	39	1	2	1	27	12	39

PHYS 4900	UPPER	25	20	20	75	60	60	3	3	3	25	20	20
PHYS 4910	UPPER	0	10	0	0	30	0	0	1	0	0	30	0
PHYS 4950	UPPER	4	8	5	8	17	15	3	3	3	3	6	5
PHYS 4999	UPPER	9	12	1	18	20	1	3	3	3	6	7	0
report total	LOWER	4206	4156	4320	16279	16123	16490	202	197	205	81	82	80
report total	UPPER	253	306	272	839	996	903	31	33	35	27	30	26

Honors Students Enrollments (1.a.5.1)

Course	**Fall2014**	**Fall 2015**	**Fall2016**
Phys2211K	35	43	31


Enrollment in Cross Listed Courses
Fall 2014
Fall2016
Fall2016
24
21
27
10
1
2
9
9
4
4
7
6
4
8
3
5
2
4
1
1
3
1
2
2
5
4
3
1
1
1
0
1
0
3
0
3
MATH 4265
MATH 6265
NEUR 4330
NEUR 4340
NEUR 6330
NEUR 6340
PHYS 4340
PHYS 4520
PHYS 4710
PHYS 6340
PHYS 6520
PHYS 6710

A7 Student Learning Objectives for the BS in Physics

Assessment of student learning (1.a.3.1):

The Student Learning Objectives (SLOs) for the BS in Physics are:

- Students develop questions appropriate for research.
- Students appropriately collect experimental or theoretical data to address identified research questions.
- Students analyze and interpret data to evaluate research questions.
- Students use results of data analysis to formulate new research questions.
- Students choose appropriate ways to communicate information in words, graphs, and figures.
- Students communicate correct kinds of information in each section of scientific report.
- Students understand and reflect an understanding of the appropriate audience.
- Students demonstrate a knowledge of core principles in modern physics, statistical and thermal physics, classical mechanics, and electricity and magnetism.
- Students effectively apply their knowledge in the above areas to solve problems, using ordinary differential equations and vector calculus where appropriate.

The first seven SLOs are assessed in two required courses focused on learning scientific thinking and communication, Advanced Physics Laboratory and Research Project. In these courses students learn to apply physics principles to solve new problems and to communicate their ideas, efforts, and conclusions in the style of scientific journal articles. Over the past three years our assessments have shown that physics majors are achieving competence in each of these seven SLOs in the junior-level Advanced Physics Lab and approaching mastery in the Research Project.

The last two SLOs focus on content knowledge, math, and problem-solving skills in the four key areas of the program; modern physics (including basic quantum mechanics), statistical & thermal physics, classical mechanics, and electricity & magnetism. Prior to the last three years, assessments had shown that students were not achieving target levels in these content areas and particularly in applying the principles using math and problem-solving skills, particularly in classical mechanics and electricity & magnetism. For that reason, the department has revised the core requirements over the last three years to now include a required course in Mathematical Methods and Computational Physics. A follow-up course will be required for all students in the standard program (graduate school track) and will be an option for students in all other concentrations. The goal is to improve physics majors core competency in mathematical thinking and problem solving prior to taking advanced courses. Future assessments will track progress in student learning in these areas.

A8 Transition Student Data

Physics BS Student Transfer and Tracking Data (1.a.3.3)

Historically, many BS students enrolled in lower level physics courses at GSU as a preparation to transfer into other programs in Georgia, in particular in engineering at the Georgia Institute of Technology (GSU lacks an engineering degree program). Most of these students are eventually awarded a degree, so it is important to include these cases in considering the GSU retention and degree rates (see Appendix A2). Erik Lauffer and Erin Brown of the GSU Office of Institutional Research collected the following data on transfer students beginning with the Fall 2010 entering cohort of First-Time, Full Time students. These numbers were collected from the National Student Clearinghouse (NSC). We show here statistics for the Fall 2010 to Fall 2013 cohorts; data on more recent cohorts represent in progress students only.

Table 1: Enrollment and Graduation Summary - Fall 2010 Cohort (Student enrollment and degree counts)

Description	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Four-year degree from GSU	0	0	0	4	2	1	1
Two-year degree from GSU	0	0	0	0	0	0	0
Four-year degree from other institution	0	0	0	4	3	4	1
Two-year degree from other institution	0	0	0	0	0	0	0
Retained at GSU	30	21	14	7	4	4	1
Retained at other four-year institution	0	8	14	9	6	5	2
Retained at other two-year institution	0	0	1	1	0	0	0

Table 2: Enrollment and Graduation Summary - Fall 2011 Cohort (Student enrollment and degree counts)

Description	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Four-year degree from GSU	0	0	1	6	1	0
Two-year degree from GSU	0	0	0	0	0	0
Four-year degree from other institution	0	0	0	1	3	1
Two-year degree from other institution	0	0	0	0	0	0
Retained at GSU	22	18	11	6	1	1
Retained at other four-year institution	0	4	5	4	1	0
Retained at other two-year institution	0	0	0	0	0	0

Table 3: Enrollment and Graduation Summary - Fall 2012 Cohort (Student enrollment and degree counts)					
Description	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2017-18**
Four-year degree from GSU	0	0	1	6	4
Two-year degree from GSU	0	0	0	0	0
Four-year degree from other institution	0	0	0	1	0
Two-year degree from other institution	0	0	0	0	0
Retained at GSU	21	18	15	7	4
Retained at other four-year institution	0	2	2	2	3
Retained at other two-year institution	0	1	0	0	0

Table 4: Enrollment and Graduation Summary - Fall 2013 Cohort (Student enrollment and degree counts)				
Description	**2014-15**	**2015-16**	**2016-17**	**2017-18**
Four-year degree from GSU	0	0	1	9
Two-year degree from GSU	0	0	0	0
Four-year degree from other institution	0	0	0	0
Two-year degree from other institution	0	0	0	0
Retained at GSU	30	29	21	9
Retained at other four-year institution	0	2	6	6
Retained at other two-year institution	0	0	0	0

Note 1: Student enrollment and degree counts are included through the first four-year degree only. Subsequent enrollment and degrees earned by four-year graduates are not counted.

Note 2: Students completing two-year degrees are counted until they receive a four-year degree. Subsequent enrollment and degrees earned by two-year graduates are counted.

Transition Student Colleges and Universities (1.a.3.3)

The following tables list the first transfer destination school and the leading transfer schools where graduation occurred.

Top FIRST institutions transferred to after GSU	
GEORGIA INSTITUTE OF TECHNOLOGY	36%
UNIVERSITY OF GEORGIA	10%
GEORGIA PERIMETER COLLEGE	8%
KENNESAW STATE UNIVERSITY	8%
GEORGIA GWINNETT COLLEGE	7%
GEORGIA STATE UNIVERSITY- PC DECATUR	6%
SOUTHERN POLYTECHNIC STATE UNIVERSITY	4%
AUGUSTA UNIVERSITY	2%
GEORGIA SOUTHERN UNIVERSITY	2%

Note 1: 84 students from the all GSU cohorts combined transferred to other institutions. These are the FIRST institutions to which they transferred. Some students have more subsequent transfers, but those are not counted here. Only institutions that accounted for 2% or more of students are shown (a total of 70 students and 9 institutions). Institutions that accounted for less than 2% of students are not shown (a total of 14 students and 14 institutions).
Note 2: These totals may differ slightly from transfer counts totaled from the cohort tables. A small number of students were missing institution name and school code data in their records. Those students are not counted in these figures.

Top institutions graduated from after GSU	% of Total	Student count
GEORGIA INSTITUTE OF TECHNOLOGY	61%	11
UNIVERSITY OF GEORGIA	28%	5
KENNESAW STATE UNIVERSITY	11%	2

Note 1: 18 students from all the GSU cohorts combined graduated from other institutions. These three institutions together account for all students.
Note 2: These totals may differ slightly from graduation counts totaled from the cohort tables. A small number of students were missing institution name and school code data in their records. Those students are not counted in these figures.

Total Numbers of Degrees from GSU and Elsewhere (1.a.3.3)

Cohort	Number entering	Total Deg. GSU	Total Deg. Other
Fall 2010	30	8	12
Fall 2011	24	8	5
Fall 2012	23	10	1
Fall 2013	31	10	0

The table above shows the total number of degrees awarded from GSU and elsewhere over the whole reporting period. There was a dramatic reversal in the ratio of degrees from GSU versus elsewhere, which indicates that most students now prefer to complete their work at GSU.

Year 5 Retention Plus Graduation Rates (1.a.3.3)

Fall Cohort	Number entering	Retained GSU	Retained Other	Degree GSU	Degree Other	#	Retained + Degree
2010	30	7	10	4	4	25	83%
2011	24	6	4	7	1	18	75%
2012	23	7	2	7	1	17	74%
2013	31	9	6	10	0	25	81%

This table shows the numbers still retained or awarded degrees by year 5 (where year 1 is the starting year). The final column gives the percentage of those completed or still actively pursuing a degree, which indicates that a large fraction of entering students have earned degrees or are in the final stages of doing so, either at GSU or elsewhere.

Enhancing Diversity in Physics Teacher Preparation through the Georgia State University PhysTEC Project

Brian Thoms, Department of Physics and Astronomy, Georgia State University

Introduction

As a PhysTEC (Physics Teacher Education Coalition) comprehensive site in the second year of a three year grant, the Georgia State University (GSU) team is working to further develop our model of physics teacher recruitment and development at a diverse, urban research university. One of our goals is to prepare and support more physics teachers from under-represented minority (URM) groups. In addition to creating a well-qualified physics teacher work force in the Atlanta area, this also creates role models and mentors for a diverse high school student population to inspire them toward pursuing careers in science and engineering (and maybe even physics teaching).

Recent efforts to build a thriving physics program with increased minority student success have established the foundation for producing more diverse physics teachers. Our PhysTEC project attempts to use a teacher-in-residence, learning assistants, and recruiting to bring more and more diverse students into physics teaching.

Physics at an Urban Research University

The setting of the university provides an excellent opportunity to increase the involvement of URM in physics and physics teaching. GSU is a growing urban research university whose 25,000 undergraduates form a vibrant and diverse community consisting of 37% White, 38% African American, 13% Asian, and 8% Hispanic students. GSU is diverse in other ways with half of all undergraduates being PELL eligible, over one third are first-generation college attendees, and one quarter are adult learners. Although there are no engineering programs at GSU, 18% of undergraduates are majoring in a STEM area.

Just having URM students at the university doesn't bring them into the physics program or the teacher track. We followed successful efforts such as those described in the SPIN-UP report[1] to build a thriving BS program, doubling the number of physics majors in five years, and tripling the number of physics BS degrees in the last three years as seen in the tables below.

Increasing Diversity in the Physics Program

Also of note is that these increases in the physics program have produced a substantially larger impact on the number of minority students receiving Physics BS degrees. Although efforts to build the physics program were not aimed at minority students, removing the barriers proved to be more important for these students. Among these efforts were increasing the flexibility of the degree program requirements and making student class schedules more efficient. These program changes were important because many, if not most, of our students work outside of classes, and anecdotally we have seen that minority students often work more hours than our majority students. Further, a new concentration was developed for physics teacher education in which students are certified as high school physics teachers within their bachelor's degree program.

Another significant change affecting minority participation in physics is the introduction of a freshman seminar. Our physics majors enter with a wide range of math preparation and most students take several math courses before they can begin the introductory calculus-based physics courses, meaning that they had little contact with the physics department or other physics majors in their first year. By introducing a class required for freshman physics majors, "Gateway to Physics," aimed not at physics content but rather at physics as a career, students have the opportunity to develop their physics identity. This course has a much larger percentage of minority students compared with upper division physics courses, emblematic of the pipeline issues in physics. The Gateway course is an opportunity to present students with a realistic view of physics careers, including high school physics teaching, and provides the opportunity for students to see and meet a diverse group of physics majors.

Tables I and II: Data on degrees and majors in GSU Physics BS program.

Year	Physics BS Degrees	URM	Female
2009-2010	8	1	3
2010-2011	8	1	2
2011-2012	6	1	1
2012-2013	15	5	4
2013-2014	23	6	5

Term	Physics BS Majors
Fall 2009	91
Fall 2010	113
Fall 2011	127
Fall 2012	154
Fall 2013	161
Fall 2014	195

The third significant action to build the program was the reinforcement of the physics club (Society of Physics Students). By giving them control of their room (even over furniture and paint) and support from faculty members, membership in SPS increased from less than 20 to over 50 students. This is another opportunity for students to find support as they make their way through the program which may be particularly important for first generation and minority students.

Student Teacher Rick Farfan

Increasing Diversity in the Physics Teacher Program

A key element involved in the recruiting and mentoring of future physics teachers for the PhysTEC program nationally is the Teacher in Residence (TIR). In the first year of our PhysTEC project we were fortunate to have Elizabeth Walker, an African-Ameri- can woman with over 20 years of physics teaching experience, as our TIR. Through visits to the freshman Gateway class and other classes, Elizabeth was a living demonstration of the opportunities for successful careers in physics teaching for students from URM

Student Teacher Sebastian Ortiz

are recent and there has been some success. The education concentration leading to physics certification was introduced in Fall 2012 and graduated its first students in December 2013. One of four students certified in 2013-2014 was an URM as are two of the five students performing internships in 2014-2015.

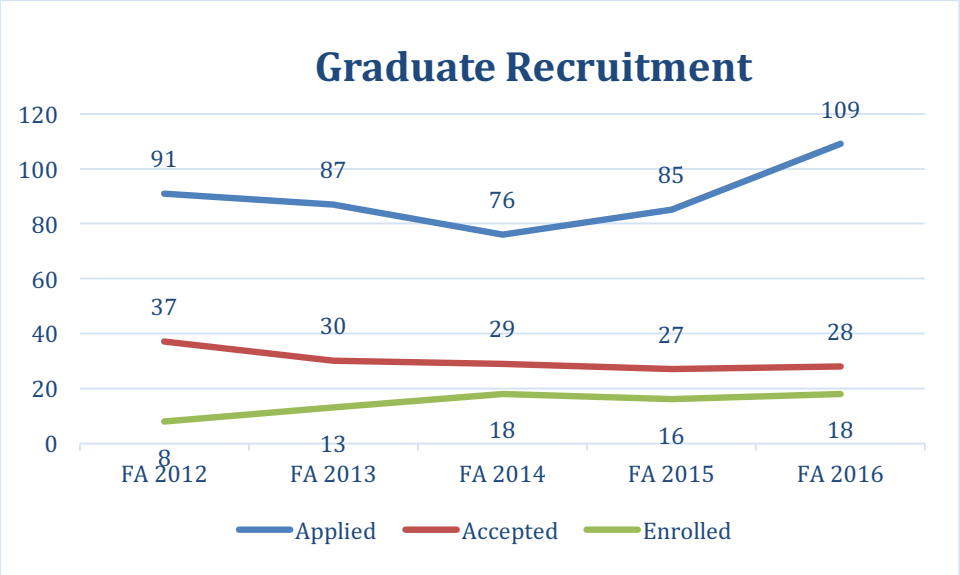
Brian Thoms is an Associate Professor of Physics at Georgia State University where he has taught for 19 years. He also serves as Associate Chair and Undergraduate Director for the Department of Physics & Astronomy and as PI for the GSU PhysTEC Comprehensive Site Grant.

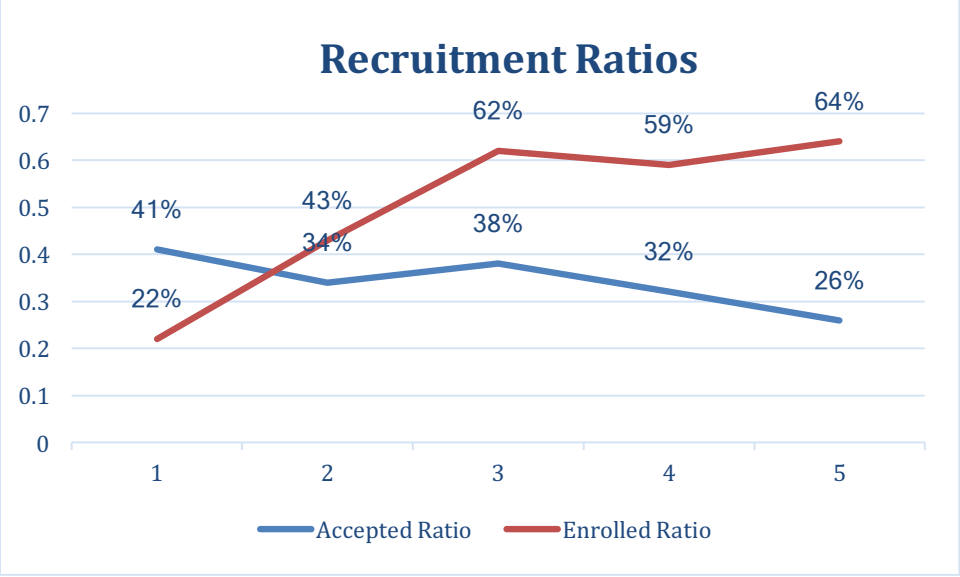
1. The Strategic Programs for Innovations in Undergraduate Physics (SPIN-UP): Project Report is available at the APS website: http://www.aps.org/programs/education/undergrad/faculty/spinup/spinup-report.cfm.

B1 Quality of Entering Graduate Students

Application statistics and GRE scores for enrolled students (1.b.1)

Term	Applied	Accepted	Enrolled	Accepted Ratio	Enrolled Ratio	PPGRA	Avg PPGRA Amount	V %ile	Q %ile
FA 2012	91	37	8	41%	22%	7	$5,868	66	83
FA 2013	87	30	13	34%	43%	10	$5,983	45	80
FA 2014	76	29	18	38%	62%	16	$6,167	54	73
FA 2015	85	27	16	32%	59%	14	$6,726	36	66
FA 2016	109	28	18	26%	64%	17	$6,569	44	71





B2 Retention, Progress Toward Degree and Graduation Rates for Recent Cohorts

Graduate Enrollment by Concentration (1.b.1)

Degree	Major	Concentration	FA 2012	FA 2013	FA 2014	FA 2015	FA 2016
MS	Physics	Astronomy	2	3	2	2	2
	Physics	Biophysics	0	1	1	0	0
	Physics	Undeclared	6	9	6	3	2
	Total (MS)		8	13	9	5	4
ND	Astronomy	Undeclared	1	0	0	0	0
	Total (ND)		1	0	0	0	0
PhD	Astronomy	Astrophysics	2	2	1	1	1
	Astronomy	Undeclared	20	21	23	27	27
	Physics	Applied Physics	2	2	3	2	2
	Physics	Astronomy	1	0	0	0	0
	Physics	Astrophysics	1	0	0	0	0
	Physics	Atomic Physics	0	0	0	1	1
	Physics	Biophysics	4	6	6	8	8
	Physics	Condensed Matter Physics	11	13	18	23	27
	Physics	Nuclear Physics	3	3	4	3	4
	Physics	Undeclared	11	11	8	6	5
	Total (PhD)		55	58	63	71	75
	Dept Total		64	71	72	76	79

Degrees Conferred by Fiscal Year (1.b.7)

Deg.	Major	Concent.	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	Average
MS	Physics	Applied Physics	1	0	0	0	0	0.2
	Physics	Astronomy	2	0	1	0	4	1.4
	Physics	Astrophys.	0	1	0	0	0	0.2
	Physics	Biophysics	1	2	1	0	0	0.8
	Physics	Condensed Matter	0	6	0	0	0	1.2
	Physics	Nuclear Physics	0	1	0	0	0	0.2
	Physics		7	8	6	7	10	7.6
	Total (MS)		11	18	8	7	14	11.6
PhD	Astron.	Astrophys.	0	1	0	0	1	0.4
	Astron.		3	0	3	3	5	2.8
	Physics	Applied Physics	0	0	0	0	1	0.2
	Physics	Astrophys.	1	0	0	0	0	0.2
	Physics	Atomic Physics	0	0	1	0	0	0.2
	Physics	Biophysics	0	1	1	2	0	0.8
	Physics	Condensed Matter	1	0	0	1	2	0.8
	Physics	Nuclear Physics	0	1	0	1	1	0.6
	Physics		2	4	3	1	1	2.2
	Total (PhD)		7	7	8	8	11	8.2
	Dept Total		18	25	16	15	25	19.8

Time-to-degree for FA 2013 to SU 2016 (1.b.4.10)

Major	Number of Graduates	Average Years To Degree
Astronomy (PhD)	9	7.7
Physics (PhD)	15	6.2

Similar Time to Physics PhD at U.S. Universities

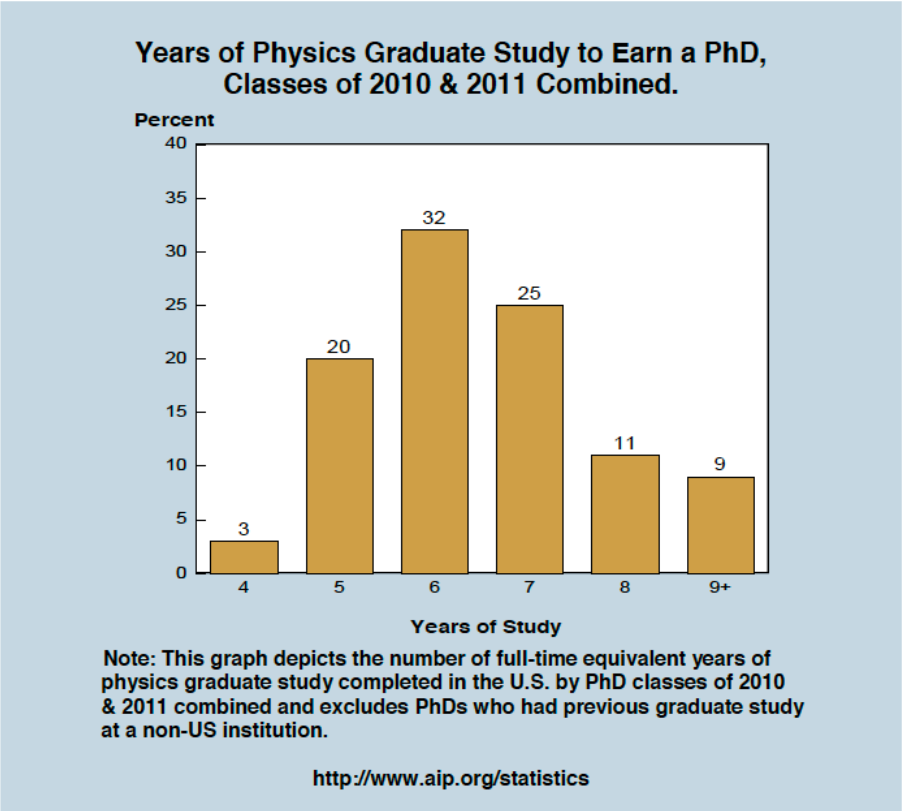
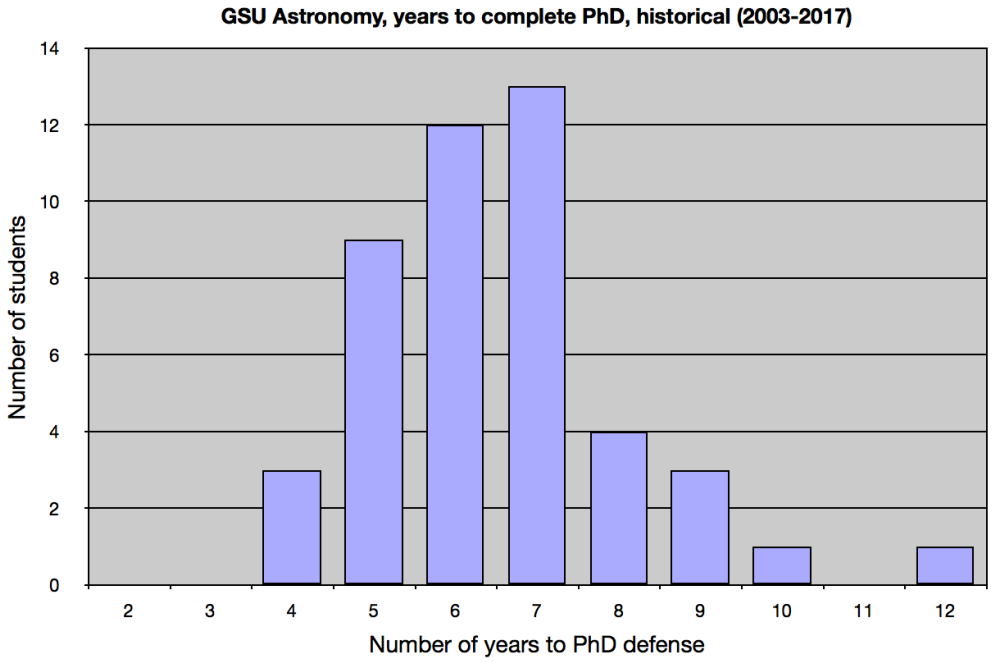


Figure from Mulvey & Nicholson (2014, *Trends in Physics PhDs*, AIP).

Similar Time to Astronomy PhD at GSU



Graduate Retention and Graduation Rates for Fall 2009 Cohort (1.b.4.3)

Deg. Major	Cohort	YR1	YR2	YR3	YR3	YR3	YR4	YR4	YR4	YR5	YR5	YR5	YR6	YR6	YR6	YR7	YR7	YR7	YR8	YR8	YR8
	FA 2009	EN 2010	EN 2011	EN 2012	GR 2012	RE 2012	EN 2013	GR 2013	RE 2013	EN 2014	GR 2014	RE 2014	EN 2015	GR 2015	RE 2015	EN 2016	GR 2016	RE 2016	EN 2017	GR 2017	RE 2017
PhD Astro	4	3	2	2	0	2	1	0	1	2	0	2	2	0	2	1	1	2	0	2	2
MS Phys	4	4	4	2	1	3	1	3	4	1	3	4	0	4	4	0	4	4	0	4	4
PhD Phys	10	10	9	7	0	7	7	0	7	7	0	7	5	2	7	3	4	7	0	7	7
Year Total	18	17	15	11	1	12	9	3	12	10	3	13	7	6	13	4	9	13	0	13	13

HEADINGS: EN=ENROLLED, GR=GRADUATED, RE=RETAINED.

Graduate Student to Faculty Ratio (1.b.2.4)

Term	Faculty	Degree Level	Graduate	Stu./Fac.
FA 2012	23	Doctorate	55	3.1
		Masters	8	0.4
		Non-Degree, Post Bac.	1	0.1
		Term Total:	64	3.6
FA 2013	26	Doctorate	58	2.8
		Masters	13	0.6
		Term Total:	71	3.4
FA 2014	28	Doctorate	63	2.6
		Masters	9	0.4
		Term Total:	72	3.0
FA 2015	28	Doctorate	71	3.1
		Masters	5	0.2
		Term Total:	76	3.3
FA 2016	30	Doctorate	75	3.0
		Masters	4	0.2
		Term Total:	79	3.2

Note: Ratio in final column is based on number of T/TT faculty in Fall semester.

Undergraduate and Graduate Student Number Ratios (1.b.2.2)

Student Level	FA 2012	%	FA 2013	%	FA 2014	%	FA 2015	%	FA 2016	%
Undergraduate Total	148	70	157	69	190	73	190	71	187	70
Graduate Total	64	30	71	31	72	28	76	29	79	30
Total	212	100	228	100	262	100	266	100	266	100

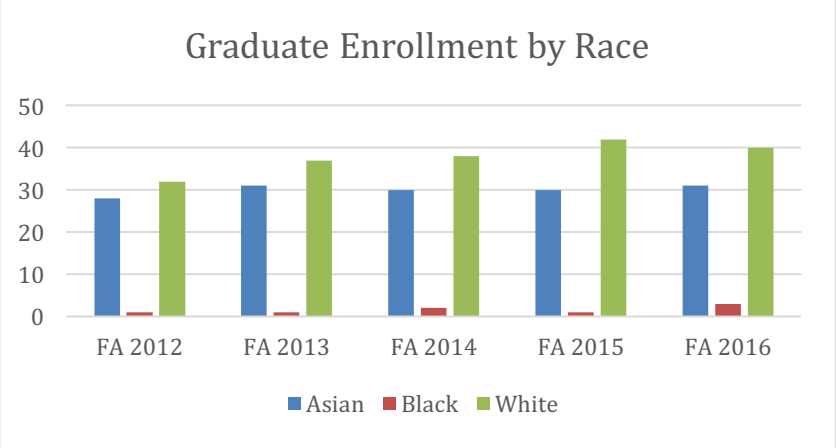
MS Graduate Placement Rates (1.b.4.4)

Major	Bachelor	Masters	Doctoral	Juris Doctor	Others	Total
Physics (MS)	0	2	6	0	0	8

B3 Graduate Population

Enrollment by Race (1.b.4.5)

Term	Asian	Black	White	Natv HI/Pa Isld	Am Ind/AA Natv	Not Reported	Multi-Racial	Total
FA 2012	28	1	32	0	0	3	0	64
FA 2013	31	1	37	0	0	2	0	71
FA 2014	30	2	38	0	0	2	0	72
FA 2015	30	1	42	0	0	2	1	76
FA 2016	31	3	40	0	0	4	1	79



National Demographics by Race

Race and Ethnicity of Physics PhDs, Classes of 2010 through 2012.

	3-Year Average Number	Percent of all Physics PhDs	Percent of U.S. Physics PhDs*
White	744	45	88
Asian American	41	2	5
Hispanic American	28	2	3
African American	17	1	2
Other U.S. Citizens	13	1	2
Non-U.S. Citizens	826	49	-
Total	1,669	100%	100%

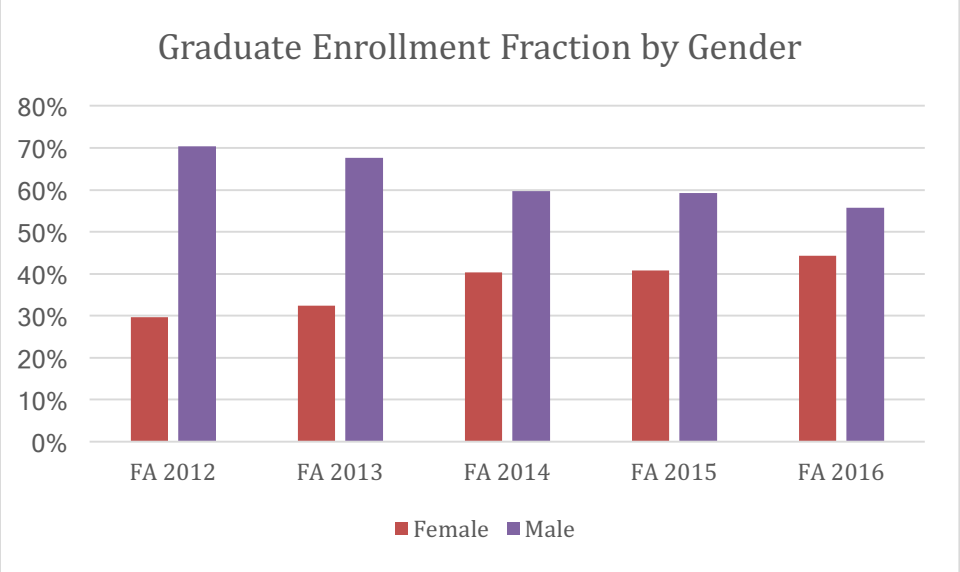
***Based on a 3-year average of 843 U.S. citizens.**

http://www.aip.org/statistics

Table from Mulvey & Nicholson (2014, *Trends in Physics PhDs*, AIP).

Enrollment by Gender (1.b.4.5)

Term	Female	%	Male	%	Total
FA 2012	19	30%	45	70%	64
FA 2013	23	32%	48	68%	71
FA 2014	29	40%	43	60%	72
FA 2015	31	41%	45	59%	76
FA 2016	35	44%	44	56%	79



National Demographic Trends (1.b.4.5)

Group	Astronomy	Physics
Female	37%	19%
Non-US	25%	49%

Astronomy data for 2012 first year enrolled graduate students (Mulvey & Nicholson 2014, *Astronomy Enrollments and Degrees*, AIP).
Physics data for years 2010-2012 total enrollments (Mulvey & Nicholson 2014, *Trends in Physics PhDs*, AIP).

Level of Financial Need (1.b.4.6)

Academic Program	FA 2014 Students	FA 2014Avg Gross Need	FA 2014Avg Unmet Need	FA 2015 Students	FA 2015Avg Gross Need	FA 2015Avg Unmet Need	FA 2016 Students	FA 2016Avg Gross Need	FA 2016Avg Unmet Need
Astron. (PhD)	7	$11,487	$8,005	6	$12,819	$9,052	5	$12,285	$6,182
Physics (MS)	3	$28,620	$6,045	2	$24,272	$9,761	0		
Physics (PhD)	5	$14,972	$840	5	$12,857	$2,486	9	$16,479	$7,121
Summary	15	$16,075	$5,225	13	$14,596	$6,636	14	$14,981	$6,785

These numbers come from the GSU financial aid office. Average gross need is the amount the federal government says the student needs to cover the costs of a year of tuition and fees. Unmet need is gross need minus the amount of financial aid the student has received, or the out-of-pocket cost to the student.

3170 Astronomy

Programs Offered:

- **Master of Science**
  - **Physics Master of Science with a Concentration in Astronomy (see section 3340)**
- **Doctor of Philosophy in Astronomy**

Department of Physics and Astronomy
Room 605, 25 Park Place
Atlanta, Georgia 30302-4106
404-413-6033
phy-astr.gsu.edu
Email (Administrative Coordinator): kwright14@gsu.edu
Email (Director of Graduate Studies): slepine@astro.gsu.edu
D. Michael Crenshaw, Chair
Sebastien Lepine, Director of Graduate Studies, Astronomy
The Department of Physics and Astronomy works closely with the graduate students on theoretical and experimental research in the following areas: atomic physics, biophysics, molecular physics, nuclear physics, condensed matter physics, astronomy, and astrophysics. See the Physics degree section for studies in the first five subjects.
Applicants may obtain additional information about the Department of Physics and Astronomy by contacting the Director of Graduate Studies at the address above. Applications should be submitted online through the Graduate Admissions system of the College of Arts and Sciences (http://cas.gsu.edu/graduate-studies/admissions/).

Degree Requirements

Doctor of Philosophy in Astronomy (71 hours beyond the baccalaureate degree)

1. Students must either complete or exempt PHYS 6510, PHYS 6520, 6810], PHYS 7600, and PHYS 7700 (0-17 credit-hours). Exemption from these courses may be granted on the basis of testing or of having successfully completed similar courses elsewhere. Students not exempting at least two courses must take more than the 71 minimum hours required for the degree.
2. Students must have competence in the following areas of mathematics: matrix algebra, vector and tensor analysis, partial differential equations, Fourier series and boundary value problems, and complex variables.
3. Students seeking a Ph.D. degree in astronomy must complete the following six core courses (20):
   - ASTR 6200 Applications in Modern Astronomy (3)
   - ASTR 6100 Astronomical Techniques and Instrumentation (3)
   - ASTR 8000 Stellar Atmospheres and Spectroscopy (4 credit-hours)
   - ASTR 8100 Stellar Structure and Evolution (4)

- ASTR 8300 Interstellar Medium (3)
- ASTR 8400 Extragalactic Astronomy (3)
- Students seeking a Ph.D. degree in Astronomy must complete at least 15 additional hours of 8000-level astronomy courses, including at least two (but no more than three) hours of ASTR 8900 Seminar. No more than three hours of either ASTR 8710 Research Topics in Astronomy or ASTR 8910 Directed Study can count towards the degree. Alternatively, up to 12 hours of 8000-level physics (PHYS) or computer science (CSC) courses may be counted against the minimum of 15 additional hours

4. Satisfactory completion of one hour of ASTR 6300 Teaching Astronomy and two hours of ASTR 6310 Teaching Astronomy Lab Practicum.
5. A minimum of 30 hours of ASTR 9999 Doctoral Dissertation Research must be completed; only 34 hours of these count towards the 71 hours for the Ph.D.
6. Proficiency in an approved language or research skill. Contact the graduate director for details.
7. General Examinations:
   - Students seeking a Ph.D. degree in Astronomy must take the first astronomy general examination, administered as a written examination covering the fundamentals of astronomy, within a year of entering the program.
   - Students seeking a Ph.D. degree in Astronomy must also take the second general examination, administered as a written and oral examination, after passing at least twelve hours of 8000-level astronomy courses.
8. Students pursuing the Ph.D. degree are strongly urged to satisfy the requirements for the Physics M.S. with a Concentration in Astronomy (non-thesis option) as soon as possible after entering the program. See the director of graduate studies for details.
9. An oral presentation and discussion of the student's proposed dissertation research, by the end of the third year after admission to the program.
10. A dissertation.
11. A final oral presentation and defense of the dissertation.

Prior to registration each semester, students should be advised by either the chair of the department or the director of graduate studies.

3340 Physics

Programs Offered:

- **Master of Science in Physics**
  - **Standard Program**
  - **Concentration in Astronomy**
- **Doctor of Philosophy in Physics**
  - **Concentration in Atomic Physics**
  - **Concentration in Biophysics**
  - **Concentration in Molecular Physics**
  - **Concentration in Nuclear Physics**
  - **Concentration in Condensed Matter Physics**
  - **Concentration in Astrophysics**
  - **Concentration in Applied Physics**

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D. Michael Crenshaw, Chair
Xiaochun He, Director of Graduate Studies, Physics
The Department of Physics and Astronomy works closely with graduate students on theoretical and experimental research in the following areas: atomic physics, biophysics, molecular physics, nuclear physics, condensed matter physics, astronomy, and astrophysics.
Applicants may obtain additional information about the Department of Physics and Astronomy by visiting the departmental website or by contacting the Administrative Coordinator and/or Director of Graduate Studies at the addresses above. Applications should be submitted online through the Graduate Admissions system of the College of Arts and Sciences (cas.gsu.edu/graduate-studies/admissions/).

Degree Requirements

Master of Science in Physics (30)

1. Students must either complete or exempt PHYS 6510, PHYS 6520, PHYS 6810, PHYS 7600 and PHYS 7700 (0-17 credit-hours). Exemption from these courses may be granted on the basis of testing or of having successfully completed similar courses elsewhere. Students not

exempting at least two courses must take more than 30 hours to complete the degree requirements.

2. Students must have competence in the following areas of mathematics: matrix algebra, vector and tensor analysis, partial differential equations, Fourier series and boundary value problems, and complex variables.
3. Students must complete the following core courses:
    - PHYS 8010 Advanced Classical Mechanics (4)
    - PHYS 8100 Electromagnetic Theory I (3)
    - PHYS 8210 Quantum Mechanics I (3)
    - PHYS 8310 Statistical Mechanics (3)
4. Students must complete additional graduate level courses appropriate to the focused research area (0-11 credit-hours). Course choices should be selected after discussion with the research adviser, and approval of the graduate director. No more than two hours of ASTR 6300/PHYS 6300 Teaching Physics/Astronomy, one hour of ASTR 6310/PHYS 6310 Teaching Physics/Astronomy Lab Practicum, and three hours of ASTR 8710/PHYS 8710 Research Topics or ASTR 8910/PHYS 8910 Directed Study can be applied to the M.S. degree requirements.
5. Proficiency in an approved language or research skill. Contact the department for details.
6. A general examination.
7. Six hours of PHYS 8999 Thesis Research.
8. A thesis.
9. A final oral presentation directed primarily to the defense of the thesis

Master of Science in Physics, Concentration in Astronomy (30)

1. Students must either complete or exempt PHYS 6510, 6520, 6810, 7600 and 7700 (0-17 credit-hours). Exemption from these courses may be granted on the basis of testing or of having successfully completed similar courses elsewhere. Students not exempting at least two courses must take more than 30 hours to complete the degree requirements.
2. Students must have competence in the following areas of mathematics: matrix algebra, vector and tensor analysis, partial differential equations, Fourier series and boundary value problems, and complex variables.
3. Students must complete the following six core courses (20):
    - ASTR 6100 Astronomical Techniques and Instrumentation (3)
    - ASTR 6200 Applications in Modern Astronomy (3)
    - [ASTR 8000 Stellar Atmospheres and Spectroscopy (4)
    - ASTR 8100 Stellar Structure and Evolution (4)

- ASTR 8300 The Interstellar Medium (3)
- ASTR 8400 Extragalactic Astronomy (3)

4. Six credit hours of PHYS 8999 Thesis Research.
5. Additional graduate level courses should be taken to complete the 30 hours degree requirements (0-4 credit-hours). No more than three hours total of ASTR 6300/PHYS 6300 Teaching Physics/Astronomy and ASTR 6310/PHYS 6310 Teaching Physics/Astronomy Lab Practicum, and no more than three hours of ASTR 8710/PHYS 8710 Research Topics or ASTR 8910/PHYS 8910 Directed Study can be applied to the M.S. degree requirements.
6. Proficiency in an approved language or research skill. Contact the department for details.
7. A general examination:
   - Students seeking an MS degree in Physics, concentration in Astronomy, must pass the first astronomy general examination, administered as a written examination covering the fundamentals of astronomy, within a year of entering the program.
8. A thesis.
9. A final oral presentation directed primarily to the defense of the thesis.

Master of Science in Physics, Non-Thesis Option (36)

1. Students must either complete or exempt PHYS 6510, PHYS 6520, PHYS 6810, and PHYS 7600 (0-13 credit-hours). Exemption from these courses may be granted on the basis of testing or of having successfully completed similar courses elsewhere.
2. Students must have competence in the following areas of mathematics: matrix algebra, vector and tensor analysis, partial differential equations, Fourier series and boundary value problems, and complex variables.
3. Students must complete the following core courses (13):
   - PHYS 8010 Advanced Classical Mechanics (4)
   - PHYS 8100 Electromagnetic Theory I (3)
   - PHYS 8210 Quantum Mechanics I (3)
   - PHYS 8310 Statistical Mechanics (3)
4. Students must complete at least 2 additional 8000-level physics (PHYS) courses (6-8 credit-hours), excluding PHYS 8710, PHYS 8910, or PHYS 8999. Courses should be selected in consultation with the graduate director.
5. Additional graduate level courses should be taken to complete the 36 hours degree requirements (2-17 credit-hours). No more than three hours of PHYS 6300 Teaching Physics and PHYS 6310 Teaching Physics Lab Practicum, and no more than three hours of PHYS 8710 or PHYS 8910 can be applied to the M.S. degree requirements.

6. Proficiency in an approved language or research skill. Contact the department for details.
7. A general oral examination.
8. A research paper or written report.

Master of Science in Physics, Concentration in Astronomy, Non-Thesis Option (36)

1. Students must either complete or exempt PHYS 6510, PHYS 6520, PHYS 6810, and PHYS 7600 (0-13 credit-hours). Exemption from these courses may be granted on the basis of testing or of having successfully completed similar courses elsewhere.
2. Students must have competence in the following areas of mathematics: matrix algebra, vector and tensor analysis, partial differential equations, Fourier series and boundary value problems, and complex variables.
3. Students must complete the following six core courses (20):
    - ASTR 6100 Astronomical Techniques and Instrumentation (3)
    - ASTR 6200 Applications in Modern Astronomy (3)
    - ASTR 8000 Stellar Atmospheres and Spectroscopy (4)
    - ASTR 8100 Stellar Structure and Evolution (4)
    - ASTR 8300 The Interstellar Medium (3)
    - ASTR 8400 Extragalactic Astronomy (3)
4. Students must complete at least 2 additional 8000-level astronomy (ASTR) or physics (PHYS) courses (6-8 credit-hours) excluding ASTR 8710/PHYS 8710, ASTR 8910/PHYS 8910, or PHYS 8999. Courses should be selected in consultation with the graduate director.
5. Additional graduate level courses should be taken to complete the 36 hours degree requirements (0-10 credit-hours). No more than three hours total of ASTR 6300/PHYS 6300 Teaching Physics/Astronomy and ASTR 6310/PHYS 6310 Teaching Physics/Astronomy Lab Practicum, and no more than three hours of [ASTR 8710/PHYS 8710 or ASTR 8910/PHYS 8910 can be applied to the M.S. degree requirements.
6. Proficiency in an approved language or research skill. Contact the department for details.
7. A general examination:
    - Students seeking an MS degree in Physics, concentration in Astronomy, must pass the first astronomy general examination, administered as a written examination covering the fundamentals of astronomy, within a year of entering the program.
8. A research paper or written report.

Doctor of Philosophy in Physics (71 hours beyond the baccalaureate degree)

1. Students must either complete or exempt PHYS 6510, PHYS 6520, PHYS 6810, and PHYS 7600 (0-13 hours). Exemption from these courses may be granted on the basis of testing or of having successfully completed similar courses elsewhere. Students not exempting at least two courses must take more than the 71 minimum hours required for the degree.
2. Students must have competence in the following areas of mathematics: matrix algebra, vector and tensor analysis, partial differential equations, Fourier series and boundary value problems, and complex variables.
3. Students seeking a Ph.D. degree in Physics must complete the following core courses (19):
    - PHYS 8010 Advanced Classical Mechanics (4)
    - PHYS 8100 Electromagnetic Theory I (3)
    - PHYS 8110 Electromagnetic Theory II (3)
    - PHYS 8210 Quantum Mechanics I (3)
    - PHYS 8220 Quantum Mechanics II (3)
    - PHYS 8310 Statistical Mechanics (3)
4. Students seeking a Ph.D. degree in physics must complete at least two graduate level courses appropriate to the focused research area (6-8 credit-hours). Course choices should be selected after discussion with the research adviser, and approval of the graduate director.
5. Students seeking a Ph.D. degree in physics in any concentration must complete at least 12 additional credit-hours of 8000-level physics (PHYS) courses, excluding PHYS 8710, PHYS 8910, or PHYS 8999. Courses should be selected in consultation with the student's research adviser and the graduate director. Alternatively, up to 9 credit-hours of 8000-level non-physics graduate courses in the area of concentration may be counted toward this requirement with approval of the graduate director.
6. Students must complete PHYS 6300 Teaching Physics and PHYS 6310 Teaching Physics Lab Practicum for a total of 3 credit-hours.
7. A minimum of 20 credit-hours of either PHYS 9999 or ASTR 9999 Doctoral Dissertation Research must be completed. No more than 20 credit-hours may count towards the degree.
8. Additional graduate levels courses should be taken to complete the 71 hour degree requirements.
9. Proficiency in an approved language or research skill. Contact the graduate director for details.
10. Students seeking a Ph.D. degree in Physics must take the physics general examination, administered as a written examination, after taking the required core courses.
11. Students pursuing the Ph.D. degree are strongly urged to satisfy the requirements for the M.S. (non-thesis option) as soon as possible after entering the program. See the appropriate director of graduate studies for details.
12. An oral presentation and discussion of the student's proposed dissertation research.
13. A dissertation.

14. A final oral presentation and defense of the dissertation.

Prior to registration each semester, students must be advised by either the chair of the department or the appropriate director of graduate studies.

B5 Course descriptions from Graduate Catalog

ASTR 6100	**Astronomical Techniques and Instrumentation**
Credit Hours	3.0
Description	Three lecture hours a week. Fundamentals and practical application of photography, spectroscopy, photometry, astrometry, interferometry, and current developments in detector technology and telescope design.

ASTR 6200	**Applications in Modern Astronomy**
Credit Hours	3.0
Description	This course presents an overview of modern astrophysical phenomena with an introduction to astronomical databases, plotting tools, data manipulation and visualization, and numerical analysis techniques. The course will emphasize data-driven problem solving, hands-on computational skills, and critical thinking. Cross-listed with [ASTR 4200]. Three lecture hours a week.

ASTR 6300	**Teaching Astronomy**
Credit Hours	2.0
Description	Course provides a theoretical and practical foundation for science teaching. Topics include univocal and dialogic discourse, questioning strategies, Blooms taxonomy, mental models, formative assessment and bridging, the resource framework, motivation and cooperative learning, argumentation, metacognition, nature of science, and qualities of effective teachers. Two lecture hours per week.

ASTR 6310	**Teaching Astronomy Lab Practicum**
Credit Hours	1.0
Description	Students will practice teaching astronomy lessons and apply science teaching theories and methods learned in [ASTR 6300]. One and one half hours per week.

ASTR 7010	Astronomy for Teachers I
Credit Hours	4.0
Description	Designed to give teachers a basic understanding of introductory astronomy, including celestial motions of the stars, sun, moon, and planets; historical development of our understanding of gravitation and orbital motion. Electromagnetic radiation and basic light emitting processes. Telescopes and astronomical instrumentation. Physical nature of the earth, moon, and terrestrial and Jovian planets. Information on teaching resources in astronomy will be available.

ASTR 7020	Astronomy for Teachers II
Credit Hours	4.0
Prerequisites	ASTR 7010 with grade of C or higher
Description	Designed to extend a teacher's understanding of our observations of the sun and stars with the derivation of their fundamental properties, including the conditions and fusion reactions below their surfaces. Matter between stars and stellar birth; old-age; and death, including neutron stars and black holes. Our Milky Way and other galaxies; quasars and peculiar galaxies; evidence for and interpretation of an expanding universe. Information on teaching resources will be available.

ASTR 7910	Directed Study in Astronomy for Teachers
Credit Hours	1.0 - 4.0
Description	Areas of study and credit to be determined by the department.

ASTR 8000	Stellar Atmospheres and Spectroscopy
Credit Hours	4.0
Description	Physics of radiative transfer in stellar atmospheres and the formation of continuous and line spectra with particular emphasis on the spectroscopic analysis of stellar photospheres. Topics include extended atmospheres, deviations from local thermodynamical equilibrium, determination of chemical abundances in stars, and the analysis of atmospheric motions. Four lecture hours a week.

ASTR 8100	Stellar Structure and Evolution
Credit Hours	4.0
Description	The concepts of thermodynamics, hydrostatics, energy transport, and nuclear energy generation are developed to understand the structures of stars. Time-dependent versions of these relations are then used to understand star formation, stellar evolution, red giants, white dwarfs, and supernovae. Four lecture hours a week.

ASTR 8120	Plasma Physics and Magnetohydrodynamics
Credit Hours	3.0
Prerequisites	PHYS 8100 and PHYS 8110 with grades of B- or higher
Description	This course provides an introduction to the physics of plasmas, with an emphasis on developing a physical understanding of the non-intuitive nature of plasmas, and acquiring the basic techniques required for carrying out research in plasma physics.

ASTR 8150	Computational Methods for Physics and Astronomy
Credit Hours	3.0
Description	Some prior programming experience is expected. Solving astronomical problems using modern numerical methods, with a practical "hands-on" approach to code-writing. A wide range of subjects will be covered including numerical analysis (integration, differentiation, differential equations), error analysis (error propagation, bootstrapping), modeling and fitting (maximum likelihood, maximum a posteriori), time series analysis (correlations, Fourier transforms, principal component decomposition, wavelets), optimization (root finding, minimization engines), image processing (filtering, registration and comparison, inverse methods) and parallel programming.

ASTR 8200	Galactic Structure
Credit Hours	3.0
Description	Three lecture hours a week. Structure, kinematics, and dynamics of the Milky Way Galaxy and its various components.

ASTR 8300	The Interstellar Medium
Credit Hours	3.0
Description	Three lecture hours a week. Physical conditions within the various components of the interstellar medium and the observational approaches to understanding these components.

ASTR 8400	Extragalactic Astronomy
Credit Hours	3.0
Description	Three lecture hours a week. Observed distribution and properties of normal galaxies, active galaxies, and quasars; introduction to cosmology.

ASTR 8700	Observational Cosmology
Credit Hours	4.0
Description	Standard Big Bang model of the universe with emphasis on observational evidence and constraints on cosmological parameters. Expansion history, primordial nucleosynthesis, cosmic microwave background, inflation, structure formation, dark matter and dark energy. Four lecture hours a week.

ASTR 8710	Research Topics in Astronomy
Credit Hours	1.0 - 15.0
Description	Topics related to area of current research to be chosen by the instructor. May be taken more than once for credit if topics are different.

ASTR 8800	Optics in Astronomy
Credit Hours	3.0
Prerequisites	consent of the instructor
Description	Three lecture hours a week. Optical design and Fourier optics with emphasis on astronomical applications: first and third order ray theory results (foci, pupils, stops, and Seidel aberrations); experience with ZEMA code on a variety of examples will be emphasized; linear systems

	and Fourier transforms; scalar diffraction theory; and astronomical applications. A class project will be assigned.

ASTR 8850	**Planetary Science**
Credit Hours	3.0
Prerequisites	ASTR 6000 or equivalent
Description	Three lecture hours a week. Introduction to the field of planetary science; formation of the solar system, terrestrial, and Jovian planets; detailed discussion of Mars, Jupiter, Europa and Titan; discovery and characterization of extrasolar planets and brown dwarfs; overview of detection methods and analysis of recent discoveries of other solar systems.

ASTR 8900	**Seminar in Astronomy**
Credit Hours	1.0 - 3.0
Prerequisites	departmental consent
Description	Discussion of current research in astronomy. May be repeated for no more than three total credit hours.

ASTR 8910	**Directed Study in Astronomy**
Credit Hours	1.0 - 6.0
Description	Area of study and credit to be determined by the department. May include attendance and participation in seminars, colloquia, or other departmental scientific activities.

ASTR 9999	**Doctoral Dissertation Research**
Credit Hours	1.0 - 15.0
Description	

PHYS 6300	Teaching Physics
Credit Hours	2.0
Description	Course provides a theoretical and practical foundation for science teaching. Topics include univocal and dialogic discourse, questioning strategies, Blooms taxonomy, mental models, formative assessment and bridging, the resource framework, motivation and cooperative learning, argumentation, metacognition, nature of science, and qualities of effective teachers. Two lecture hours per week.

PHYS 6310	Teaching Physics Lab Practicum
Credit Hours	1.0
Description	Students will practice teaching physics lessons and apply science teaching theories and methods learned in [PHYS 6300]. One and one half hours per week.

PHYS 6340	Neurophysics
Credit Hours	3.0
Prerequisites	NEUR 3000 and PHYS 2212 with grades of B or higher, or equivalent, or consent of instructor
Description	Three lecture hours per week. Course provides fundamental findings of physics of neuronal systems. The course covers such topics as introduction to biomechanics, membranes, transport, electroosmotic effects, ion pumping, cellular homeostasis, the Hodgkin-Huxley formalism, energetics of spiking, neural coding, and dynamics of neurons and neuronal networks. It also covers methods of recording of neuronal activity.

PHYS 6410	Introduction to Nuclear and Particle Physics
Credit Hours	3.0
Prerequisites	Introduction quantum mechanics at a level of PHYS 3402 or higher with a grade of C or higher
Description	Three lecture hours a week. Properties of nuclei; nuclear models; nuclear reactions and radioactive decay processes; properties of elementary

	particles, their symmetries and interactions; standard model of elementary particles.

PHYS 6500	**Advanced Topics in Physics**
Credit Hours	3.0
Prerequisites	consent of instructor
Description	This course presents advanced topics of special interest in physics as may fit the needs and interests of advanced undergraduate/graduate students and faculty. Topics may be in the fields of nuclear physics, nanophysics, solid state physics, optics and electronics, and neurophysics. May be repeated if topics are different.

PHYS 6510	**Mathematics of Physics I**
Credit Hours	3.0
Description	(Same as [Math 6258].) Three lecture hours a week. Algebra of vectors, vector calculus, divergence, gradient, curl, line integrals, surface integrals, divergence theorem of Gauss, Stokes's theorem, conservative fields, orthogonal curvilinear coordinates, matrices, eigenvalue problems.

PHYS 6520	**Mathematics of Physics II**
Credit Hours	3.0
Prerequisites	a course in ordinary differential equations
Description	(Same as [Math 6265].) Three lecture hours a week. Derivation and solution of partial differential equations of physics, wave equation, Laplace's equation, Schroedinger's equation, poer series solution of ordinary differential equations, special functions of mathematical physics, Fourier series, Sturm-Liouville systems, complex analysis, and integration.

PHYS 6710	**Functional Neuroimaging**
Credit Hours	3.0
Prerequisites	consent of instructor
Description	(Same as [Neur 6330].) Three lecture hours a week. Foundations of

	physics principles applied to brain processes, different imaging modalities, and neuroimaging data analysis methods. Topics include physiological basis of functional neuroimaging, physics of different imaging modalities (fMRI, PET, EEG, MEG, fNIR, TMS), experimental design, neuroimaging data analysis, and applications in cognitive neuroscience. This course is appropriate for graduate students in physics, chemistry, biology, neuroscience, psychology, mathematics, statistics, and computer science with an interest in the use of functional neuroimaging.

PHYS 6720	**Introduction to Magnetism and Magnetic Materials**
Credit Hours	3.0
Description	Fundamentals of magnetism in solids, nanostructures and ferrofluids. Wide range of topics overviewing basic physics phenomena observed in magnetic materials and nanostructures will be covered, including static and dynamic phenomena, nanostructures and their applications in electronics and spintronics, ferrofluids, and the experimental approaches used to study magnetic phenomena.

PHYS 6810	**Introduction to Quantum Mechanics**
Credit Hours	3.0
Description	Three lecture hours a week. Schroedinger's theory of quantum mechanics; solutions of Schroedinger's equation; perturbation theory; one-electron atoms; magnetic moments, spin, and relativistic effects; identical particles; and multi-electron atoms.

PHYS 6910	**Solid State Physics**
Credit Hours	3.0
Prerequisites	PHYS 3401 and PHYS 3402 with grades of C or higher, or equivalent, or consent of instructor
Description	Three lecture hours a week. Atoms in crystals (crystal structure); waves in crystals; crystal binding, lattice constants; lattice vibrations and other thermal properties of solids, free electrons in crystals, energy bands, and semiconductors.

PHYS 7000	Gateway to Physics
Credit Hours	2.0
Description	Two lecture hours a week. This course is intended for anyone curious about physics and its relevance to contemporary life. It is primarily for students in the Masters of Arts in Teaching program in the College of Education but is also appropriate for students in medicine, law, and business, natural sciences, social sciences, humanities, music, and fine arts. No background in physics is necessary. The course engages a broad spectrum of resources and experiential opportunities (e.g. popular science books & articles, videos, websites, lab tours, field trips, service learning opportunities, and guest presenters) to explore compelling interconnections between physics and other disciplines and career interests. Course topics may include Physics and the Human Body, Physics and the Nano-scale, Physics and the Cosmos, Physics and Technology, Physics and Art, and Chaos & Complexity.

PHYS 7110	Conceptual Physics I
Credit Hours	3.0
Description	Designed for science teachers in the secondary and middle schools. No prior knowledge of physics is assumed. Course includes both lecture and laboratory. Dynamics, energy concepts, properties of matter, heat and thermodynamics, electricity, and magnetism.

PHYS 7111	Introduction to Physics for Teachers I
Credit Hours	4.0
Prerequisites	consent of instructor
Description	Algebra at the level of [Math 1111] and trigonometry at the level of [Math 1113] is strongly advised. Three lecture and two laboratory hours a week. Mechanics, heat, and wave motion. This course is primarily intended for students in the Masters of Arts in Teaching program in the College of Education who will be secondary science teachers, but it is open to other graduate students as well.

PHYS 7112	Introductory Physics for Teachers II
Credit Hours	4.0
Prerequisites	Instructor consent
Description	Three lecture and two laboratory hours a week. Electricity, light, modern physics. This course is intended for students in the Masters of Arts in Teaching program in the College of Education, but it is open to other graduate students as well.

PHYS 7120	Conceptual Physics II
Credit Hours	3.0
Prerequisites	PHYS 7110 with grade of C or higher, or equivalent
Description	Sound, light, atomic and nuclear physics, relativity and astrophysics, energy and the future, and advancing technology.

PHYS 7210	Physics Principles & Teaching Problems I
Credit Hours	4.0
Prerequisites	consent of instructor
Description	Students should have completed one year of introductory undergraduate physics equivalent of [Phys 1111]/1112 or [Phys 2211]/2212 before taking this course. The course will attempt to develop a deep conceptual understanding of fundamental physics concepts associated with Newtonian mechanics, energy, and waves in the pre-service science teachers taking it. A related goal will be to support these pre-service teachers in developing strategies for using their understanding to facilitate the construction of physics knowledge in the students they will come to teach. This course is primarily for students being certified to teach physics at the secondary school level in the Masters of Arts in Teaching program.

PHYS 7220	Physics Principles & Teaching Problems II
Credit Hours	4.0
Prerequisites	PHYS 7110 with a grade of B or higher or consent of instructor
Description	Students should have completed one year of introductory undergraduate physics equivalent to [Phys 1111]/1112 or [Phys 2211]/2212 before taking this course. The course will develop a deep conceptual

	understanding of fundamental physics concepts associated with electricity, magnetism, and modern physics in the pre-service science teachers taking it. A related goal will be to support these pre-service teachers in developing strategies for using their understanding to facilitate the construction of physics knowledge in the students they will come to teach. This course is primarily for students being certified to teach physics at the secondary school level in the Masters of Arts in Teaching program.

PHYS 7450	**Physics for Secondary School Teachers**
Credit Hours	3.0
Description	Three lecture hours a week. Designed both to refresh and enlarge the high school teacher's knowledge of general physics.

PHYS 7460	**Modern Physics for Secondary Teachers I**
Credit Hours	4.0
Prerequisites	PHYS 2211K-2212K with grade of C or higher, or equivalent
Description	Three lecture hours a week. Physical and quantum optics, introduction to special relativity, quantum mechanics, and atomic structure.

PHYS 7470	**Modern Physics for Secondary Teachers II**
Credit Hours	3.0
Prerequisites	PHYS 7460 with grade of C or higher, or equivalent
Description	Three lecture hours a week. Introduction to x-ray spectra, molecular structure, solid state physics, nuclear structure, and nuclear reactions.

PHYS 7600	**Classical Mechanics**
Credit Hours	4.0
Description	Four lecture hours a week. Vector algebra, Newton's laws, conservation laws, many body systems, motion in central fields, small oscillations, motion in electromagnetic fields, rotation of rigid bodies, Lagrangian equations, and Hamilton's principle, and virtual work.

PHYS 7700	Electricity and Magnetism
Credit Hours	4.0
Prerequisites	PHYS 6510 with grade of C or higher, or equivalent
Description	Four lecture hours a week. Electrostatics, steady currents, magnetic fields, magnetic induction, AC circuits, dielectrics, magnetic properties of matter, Maxwell's equations, and wave propagation.

PHYS 7800	Optics
Credit Hours	3.0
Description	Three lecture hours a week. Fundamentals and applications of optics: diffraction, interference, lasers, fiber optics, and applications of optical instruments.

PHYS 7850	Statistical and Thermal Physics
Credit Hours	3.0
Prerequisites	PHYS 2212K and MATH 2215 with grades of C or higher
Description	Three lecture hours a week. Kinetic and statistical theories of matter and their relation to classical thermal physics.

PHYS 7910	Directed Study in Physics
Credit Hours	1.0 - 3.0
Description	Areas of study and credit to be determined by the department.

PHYS 8010	Advanced Classical Mechanics
Credit Hours	4.0
Prerequisites	PHYS 4600 with grade of C or higher, or equivalent, or consent of instructor
Description	Four lecture hours a week. Newton's laws, conservation laws, many-body systems, Lagrangian equations, Hamilton's principle; motion in central fields, small oscillations, rotation of rigid bodies, Hamilton equations, canonical transformations, Hamilton-Jacobi equation, Poisson's brackets, transition to quantum mechanics.

PHYS 8100	Electromagnetic Theory I
Credit Hours	3.0
Prerequisites	PHYS 6520 with grade of C or higher, or equivalent
Description	Three lecture hours a week. Electrostatics, Poisson's and Laplace's equations, Green's functions; boundary-value problems in electrostatics; multipoles, electrostatics of macroscopic media, dielectrics; and magnetostatics.

PHYS 8110	Electromagnetic Theory II
Credit Hours	3.0
Prerequisites	PHYS 8100 with grade of C or higher, or equivalent
Description	Three lecture hours a week. Time-varying fields, Maxwell equations, conservation laws; plane electromagnetic waves and wave propagation; wave guides and resonant cavities; special theory of relativity; simple radiating systems, and radiation by moving charges.

PHYS 8120	Plasma Physics and Magnetohydrodynamics
Credit Hours	3.0
Prerequisites	PHYS 8100 and PHYS 8110 with grades of B- or higher
Description	Three lecture hours a week. This course provides an introduction to the physics of plasmas, with an emphasis on developing a physical understanding of the non-intuitive nature of plasmas, and acquiring the basic techniques required for carrying out research in plasma physics. Crosslisted with [ASTR 8120].

PHYS 8150	Computational Methods for Physics and Astronomy
Credit Hours	3.0
Description	Some prior programming experience is expected. Solving physics problems using modern numerical methods, with a practical hands-on approach to code-writing. A wide range of subjects will be covered including numerical analysis (integration, differentiation, differential equations), error analysis (error propagation, bootstrapping), modeling and fitting (maximum likelihood, maximum a posteriori), time series analysis (correlations, Fourier transforms, principal component decomposition,

	wavelets), optimization (root finding, minimization engines), image processing (filtering, registration and comparison, inverse methods) and parallel programming.

PHYS 8210	**Quantum Mechanics I**
Credit Hours	3.0
Prerequisites	PHYS 6810 with grade of C or higher, or consent of instructor
Description	Three lecture hours a week. Postulates, Schroedinger's equation, one-dimensional problems, three-dimensional problems, scattering, transformation theory, perturbation theory, Born approximation, and variation method.

PHYS 8220	**Quantum Mechanics II**
Credit Hours	3.0
Prerequisites	PHYS 8210 with grade of C or higher
Description	Three lecture hours a week. Spin, relativistic effects, many-electron atoms, second quantization, radiation field, Dirac equation, and Feynman diagrams.

PHYS 8310	**Statistical Mechanics**
Credit Hours	3.0
Description	Three lecture hours a week. Classical and quantum mechanical statistical theories of many body systems. Topics include the ergodic theorem, distributions, quantum statistics, thermodynamic interpretations, and applications.

PHYS 8370	**Advanced Neuroimaging**
Credit Hours	3.0
Description	Advanced magnetic resonance (MR) imaging and spectroscopy principles and applications to neuroscience, including experimental design and data analysis and interpretation. Covers relaxation theory and measurement, anatomic imaging, diffusion imaging, perfusion and arterial spin labeling (ASL) imaging of blood flow, and 1H and multinuclear magnetic

	resonance spectroscopy (MRS). Three lecture hours a week.

PHYS 8380	Computational Neuroscience
Credit Hours	3.0
Prerequisites	NEUR 8010 with grade of B or higher, or equivalent, or consent of instructor
Description	Three lecture hours per week. Realistic modeling dynamics of neurons and neuronal networks with emphasis on testing data-driven hypotheses. Topics include modeling intracellular calcium dynamics, voltage dependent channels, synapses, activity of neurons, and synchronization regimes of neuronal networks.

PHYS 8410	Atomic Physics
Credit Hours	3.0
Prerequisites	PHYS 6810 with grade of C or higher, or consent of instructor
Description	Three lecture hours a week. Theory of atomic spectra; scattering theory.

PHYS 8420	Molecular Physics
Credit Hours	3.0
Prerequisites	PHYS 6810 with grade of C or higher
Description	Three lecture hours a week. Molecular structure, molecular orbital theory, and molecular spectra.

PHYS 8500	Advanced Topics in Physics II
Credit Hours	3.0
Prerequisites	consent of instructor
Description	Advanced topics of special and/or current interest in physics research as may fit the needs and interests of doctoral students and faculty. Topics may be in the fields of nuclear physics, nanophysics, solid state physics, optics and electronics, and neurophysics. May be repeated if topics are different.

PHYS 8510	Solid State Physics
Credit Hours	3.0
Prerequisites	PHYS 6910 with grade of C or higher, or consent of instructor
Description	Three lecture hours a week. Thermal, electrical, magnetic, and mechanical properties of solids; crystal structure; reciprocal lattice; -ray diffraction; nearly free electrons; band structure and modifications; homogeneous and inhomogeneous semiconductors; defects and dislocations; dielectric properties of insulators; and superconductors.

PHYS 8515	Dynamical Foundations of Neuroscience
Credit Hours	3.0
Prerequisites	MATH 4010/6010 or MATH 4275/6275 or PHYS 4180/6180 with grade C or higher
Description	This course explores the mathematical principles by which brains generate spikes, make decisions, store memories, and control actions. Topics include biophysics and dynamics of single and coupled neurons, bifurcations and transitions between various types of neuronal activities; modeling of synapses, dendrites and axons; small networks; neural coding in single cells and at the population level; dynamics of large networks, including spike computing with population codes; networks learning and behavioral changes.

PHYS 8550	Physics of Thin Films
Credit Hours	3.0
Prerequisites	PHYS 6810 and PHYS 8110 with grades of C or higher, or consent of instructor
Description	Three lecture hours a week. Thin film growth methods, optical, and electrical properties of films, characterization techniques.

PHYS 8560	Nanoplasmonics.
Credit Hours	3.0
Description	Study of the fundamental properties and applications of the surface plasmonics at the nanoscale. Includes coherent effects associated with phase memory of surface plasmons, control of nanooptical phenomena, nonlinear processes, ultrafast (femtosecond and attosecond) phenomena, and quantum quasiparticles. Applications of nanoplasmonics, including the detection of ultrasmall amounts of chemical and biological compounds, scanning near-field optical microscopes (NSOMs or SNOMs), and nanolithography.

	Three lecture hours a week.

PHYS 8580	Principles of Nanospectroscopy of Materials
Credit Hours	3.0
Prerequisites	PHYS 8110 with a grade of B or higher, or consent of instructor.
Description	The following topics will be included in this course: 2D electron gas; optical properties of quantum wells; heterostructures; nanooptical microscopy techniques based on elastic and inelastic light scattering, including resonant Rayleigh scattering, interference techniques, resonant Raman scattering and photo luminescence); near-field optics; and selected topics from recent scientific literature. Three lecture hours a week.

PHYS 8610	Nuclear Physics
Credit Hours	3.0
Prerequisites	PHYS 6410 and PHYS 6810 with grades of C or higher, and consent of instructor
Description	Three lecture hours a week. Nuclear force and two and three nucleon systems; spherical and deformed nuclear shell models; collective modes; electromagnetic and weak decays; nuclear scattering and reactions.

PHYS 8650	Fundamentals of Particles and Interactions
Credit Hours	3.0
Prerequisites	PHYS 6410 and PHYS 6810 with grades of C or higher, or consent of instructor
Description	Three lecture hours a week. Relativistic wave equations; Feynman diagrams; quantum electrodynamics; quantum chromodynamics; weak interactions; and gauge theories.

PHYS 8710	Research Topics in Physics
Credit Hours	1.0 - 15.0
Description	Topics related to area of current research to be chosen by the instructor. May be repeated if topic varies.

PHYS 8800	Electronics
Credit Hours	3.0
Description	Two lecture and four laboratory hours a week. Principles of D.C. and A.C. circuits; introduction to design of analog and digital circuits; discrete and integrated circuit devices; and elements of electronic instrumentation systems. (Not open to Physics and Astronomy students.).

PHYS 8910	Directed Study in Physics
Credit Hours	1.0 - 6.0
Description	Areas of study and credit to be determined by the department.

PHYS 8999	Thesis Research
Credit Hours	1.0 - 15.0
Description	

PHYS 9999	Doctoral Dissertation Research
Credit Hours	1.0 - 15.0
Description	

B6 Course Enrollments

Course enrollment numbers, credit hours, sections for 2015 – 2017 (1.b.4.1.b)

	Heads			Hours			Sections			Hours/Sect		
Course	15	16	17	15	16	17	15	16	17	15	16	17
ASTR 6000	8	8	15	24	24	45	1	1	1	24	24	45
ASTR 6100	7	4	5	21	12	15	1	1	1	21	12	15
ASTR 6300	7	3	7	7	6	14	1	1	1	7	6	14
ASTR 6310	14	3	6	14	3	6	2	1	1	7	3	6
ASTR 6999	0	0	0	0	0	0	3	3	3	0	0	0
ASTR 7010	16	9	4	64	36	16	3	1	1	21	36	16
ASTR 7020	10	6	1	40	24	4	3	2	1	13	12	4
ASTR 7910	1	1	0	3	1	0	3	2	2	1	1	0
ASTR 8000	11	0	10	44	0	40	1	0	1	44	0	40
ASTR 8100	0	10	0	0	40	0	0	1	0	0	40	0
ASTR 8120	0	0	2	0	0	6	0	0	1	0	0	6
ASTR 8150	0	4	0	0	12	0	0	1	0	0	12	0
ASTR 8200	0	11	0	0	33	0	0	1	0	0	33	0
ASTR 8300	10	0	10	30	0	30	1	0	1	30	0	30
ASTR 8400	0	10	0	0	30	0	0	1	0	0	30	0
ASTR 8700	10	0	7	40	0	28	1	0	1	40	0	28
ASTR 8710	67	80	82	522	785	784	29	29	30	18	27	26
ASTR 8850	10	0	9	30	0	27	1	0	1	30	0	27
ASTR 8900	8	10	11	8	10	11	1	1	2	8	10	6
ASTR 8910	66	58	61	364	259	233	29	29	30	13	9	8
ASTR 9999	56	63	63	674	780	799	30	29	29	23	27	28
NEUR 6330	4	8	3	12	24	9	1	1	1	12	24	9
NSCI 7001	3	1	2	12	4	8	1	1	1	12	4	8
PHYS 6300	10	15	12	10	30	24	1	1	1	10	30	24
PHYS 6310	23	19	9	23	19	9	2	2	1	12	10	9
PHYS 6410	0	0	0	0	0	0	1	0	1	0	0	0
PHYS 6710	3	0	3	9	0	9	1	1	1	9	0	9
PHYS 6810	1	2	1	3	6	3	1	1	1	3	6	3
PHYS 6910	0	0	0	0	0	0	0	1	0	0	0	0
PHYS 6999	0	0	0	0	0	0	3	3	3	0	0	0
PHYS 7000	1	6	0	2	12	0	1	1	2	2	12	0
PHYS 7110	7	0	6	21	0	18	1	0	1	21	0	18
PHYS 7111	4	0	3	16	0	12	3	3	3	5	0	4

PHYS 7112	1	0	0	4	0	0	3	3	3	1	0	0
PHYS 7120	6	0	6	18	0	18	1	0	1	18	0	18
PHYS 7210	12	7	1	48	28	4	1	1	1	48	28	4
PHYS 7220	6	6	2	24	24	8	1	1	1	24	24	8
PHYS 7450	0	1	1	0	3	3	3	3	3	0	1	1
PHYS 7460	0	0	1	0	0	4	1	1	1	0	0	4
PHYS 7470	0	0	0	0	0	0	0	1	1	0	0	0
PHYS 7600	1	0	0	4	0	0	1	1	1	4	0	0
PHYS 7700	0	0	0	0	0	0	1	1	1	0	0	0
PHYS 7800	1	0	0	3	0	0	1	0	0	3	0	0
PHYS 7850	0	0	0	0	0	0	1	1	1	0	0	0
PHYS 7910	5	2	0	7	2	0	5	5	5	1	0	0
PHYS 8010	20	20	10	80	80	40	1	1	1	80	80	40
PHYS 8100	10	14	11	30	42	33	1	1	1	30	42	33
PHYS 8110	7	12	11	21	36	33	1	1	1	21	36	33
PHYS 8150	0	19	0	0	57	0	0	1	0	0	57	0
PHYS 8210	10	15	10	30	45	30	1	1	1	30	45	30
PHYS 8220	11	10	12	33	30	36	1	1	1	33	30	36
PHYS 8310	7	15	10	21	45	30	1	1	1	21	45	30
PHYS 8500	8	8	0	24	24	0	1	1	0	24	24	0
PHYS 8510	13	0	9	39	0	27	1	0	1	39	0	27
PHYS 8550	9	0	5	27	0	15	1	0	1	27	0	15
PHYS 8650	0	4	0	0	12	0	0	1	0	0	12	0
PHYS 8710	100	108	116	817	916	993	46	44	46	18	21	22
PHYS 8800	0	1	0	0	3	0	0	1	0	0	3	0
PHYS 8910	87	93	105	477	498	574	46	44	46	10	11	13
PHYS 8999	31	38	60	299	320	583	50	44	48	6	7	12
PHYS 9999	65	56	56	678	639	657	46	44	46	15	15	14
report total	767	760	758	4677	4954	5238	342	323	336	14	15	16

Cross Listed Courses (1.b.5.1)

Term	Course	Enrolled	Total Hours
Fall 2014	NEUR 6330	4	12
	PHYS 4710	5	15
	PHYS 6710	3	9
	MATH 4265	24	72
	MATH 6265	10	30
	PHYS 4520	1	3
	PHYS 6520	0	0
	NEUR 4340	3	9
	NEUR 4340	1	3
	NEUR 6340	5	15
	PHYS 4340	1	3
	PHYS 6340	1	3
Fall 2015	NEUR 4330	9	27
	NEUR 6330	8	24
	PHYS 4710	4	12
	PHYS 6710	0	0
	MATH 4265	21	63
	MATH 6265	1	3
	PHYS 4520	2	6
	PHYS 6520	1	3
	NEUR 4340	4	12
	NEUR 4340	3	9
	NEUR 6340	2	6
	PHYS 4340	1	3
	PHYS 6340	1	3
Fall 2016	NEUR 4330	9	27
	NEUR 6330	3	9
	PHYS 4710	3	9
	PHYS 6710	3	9
	MATH 4265	27	81
	MATH 6265	2	6
	PHYS 4520	2	6
	PHYS 6520	0	0
	NEUR 4340	5	15
	NEUR 4340	1	3

	NEUR 6340	4	12
	PHYS 4340	3	9
	PHYS 6340	1	3

B7 Refereed Publications with Student Authors

Faculty	2012	2013	2014	2015	2016
Baron	x	2	1	2	1
Abate	x	x	0	1	4
Apalkov	0	2	3	2	5
Bentz	1	4	9	5	11
Connors	x	x	x	0	0
Crenshaw	4	4	2	4	11
Dhamala	1	5	6	5	8
Dietz	4	3	3	3	1
Doluweera	0	0	0	0	0
Evans	0	0	0	0	0
Gies	8	10	5	8	8
Hastings	1	4	0	2	2
He	10	11	12	11	14
Henry	2	2	6	4	4
Jefferies	x	x	x	x	0
Kozhanov	0	0	0	1	1
Kuzio de Naray	x	0	1	3	7
Lepine	0	0	0	0	0
Mani	4	7	3	3	4
Manson	3	0	3	2	1
Martens	x	x	3	6	6
McAlister	13	7	5	3	1
McGimsey	0	0	0	0	0
Perera	5	4	6	2	7
Sarsour	0	0	4	1	7
Stockman	1	0	1	3	3
Thoms	0	1	1	1	0
Von Korff	0	0	0	1	3
Wang	0	0	0	0	0
White	10	5	3	2	6
Wilson	0	0	0	0	0
Total	**67**	**71**	**77**	**75**	**115**

B8 Current positions of graduate students 2014-2017

Physics Students

- Prabha Padukka (graduated Summer 2014) is a lecturer at Kennesaw State University.
- Mark Ye (graduated May 2015) is an Applications Engineer at Entegris.
- Han-Chun Liu (graduated December 2016) is a post-doc at the U. of Virginia.
- Xiaohang Zhang (graduated Summer 2016) is a Data Scientist at Equifax.
- Zhuo Wang (graduated Summer 2017) decided to study at GSU for a MS in Actuarial Science.
- Margaret Jezghani (graduated December 2015) is a Scientist at the U.S. Department of the Navy.
- Hameed Koochakikelaerdeh (graduated Fall 2016) is a post-doctoral research associate at GSU.
- Sampath Gamage (graduated Summer 2017) is a temporary research staff member at GSU.
- Jitto Titus (graduated Fall 2016) is CEO of a multimedia firm studioKingsarch.

Astronomy Students

- Jeremy Maune (graduated Summer 2014) is a Teaching Faculty at Georgia State University.
- Joseph Eggen (graduated Summer 2014) is a Scientific Software Developer at the University of Maryland, College Park.
- James Robert Parks (graduated Summer 2014) is a Lecturer at Louisiana State University.
- Cassy Davison (graduated Summer 2015) is a high-school science teacher in the state of Georgia.
- Jennifer Winters (graduated Fall 2015) is a post-doctoral scientist at Harvard-Smithsonian Center for Astrophysics.
- Nicholas Scott (graduated Fall 2015) is a post-doctoral scientist at NASA Ames Research Center.
- Samuel Quinn (graduated Spring 2016) is a post-doctoral scientist at Harvard-Smithsonian Center for Astrophysics.
- Jeremy Jones (graduated Summer 2016) is a post-doctoral scientist at Georgia State University.
- Rachel Matson (graduated Fall 2016) is a NASA post-doctoral fellow at Ames Research Center.
- Zhao Guo (graduated Fall 2016) is a post-doctoral scientist at the Nicolaus Copernicus Astronomical Center (Poland).
- Emily Mannes-Nicholas (graduated Spring 2017) is an adjunct teaching professor at Georgia State University.
- Daniel Horenstein (graduated Spring 2017) is a full-time Professor at Santa Anna Community College.
- Joseph Chatelain (graduated Spring 2017) is a research associate at Lowell Observatory.
- Nicole Cabrera Salazar (graduated Fall 2016) is a science and communications consultant in Atlanta.

B9 Student Learning Objectives for the PhD in Physics

Assessment of physics student learning (1.b.4.1.a):
1. Physics knowledge and mathematics skills: Students demonstrate knowledge of core principles and an ability to apply that knowledge in advanced classical mechanics, advanced electromagnetic theory, advanced quantum mechanics, and advanced statistical mechanics. Students in the applied physics or biophysics options shall be able to demonstrate and apply knowledge in certain alternative areas appropriate to their specialties. Students demonstrate and apply appropriate mathematical skills in the context of their specialization, including matrix algebra, vector and tensor analysis, Fourier series and boundary value problems, and complex analysis.

2. Scientific critical thinking skills: Students apply the basic scientific process as they perform and report their research. That is, they develop research questions appropriate for research, appropriately collect experimental and theoretical data to address identified research questions, analyze and interpret data to evaluate research questions, and use results of data analysis to formulate new research questions.

3. Scientific research technology: Students effectively use specialized scientific equipment for data collection and effectively use computers for data analysis, literature research and scientific writing in laboratory and research settings.

4. Scientific communication skills: Students communicate effectively orally and in writing in a context relevant to scientific research using appropriate formats and styles for scientific journals, meetings, conference, or colloquia.

5. Collaboration in scientific research: Students collaborate effectively with colleagues including other students, postdoctoral researchers, committee members, faculty advisor, and outside research collaborators.

SLO Assessment Methods for Physics PhD Students:
M1. Second year written and oral qualification exams (for PhD students only). (SLO #1)
M2. Third year MS presentations. (SLO #2, #3, #4)
M3. Dissertation defense, with assessment forms from advisor and thesis committee members. (SLO #2, #3, #4 and #5)

Assessments Findings during This Reporting Period:
Based on the reports collected during this review period, the performance score (ranging from 1 to 5 with 5 indicating top performance) of each SLO is given as follows:
4.9 (SLO 1), 4.7 (SLO 2), 4.7 (SLO 3), 4.5 (SLO 4) and 4.8 (SLO).

B10 Student Learning Objectives for the PhD in Astronomy

Assessment of astronomy student learning (1.b.4.1.a):

Astronomy Student Learning Outcomes (SLO):
1. General knowledge of modern astronomical concepts and research methods.
2. Understanding of the core principles of the scientific method.
3. Capacity to elaborate an independent research program.
4. Efficient communication of scientific results.
5. Capacity to carry our original research and produce significant results.

SLO assessments:
A. First year written qualification exam. (SLO #1)
B. Second year written and oral qualification exam. (SLO #1, #2)
C. Third year prospectus talk. (SLO #2, #3, #4)
D. Dissertation defense, with assessment forms from advisor and thesis committee members. (#2, #4, #5)

Assessments findings in the past three years:
A. 15 of 15 students have successfully passed the first year written qualification exam.
B. 11 of 13 students have successfully passed the second year written and oral qualification exams.
C. 9 of 11 students have presented their prospectus talks according to schedule, while 2 other students have been delayed.
D. 12 of 13 students have successfully defended a PhD or MS thesis; 1 student left the program before completing their thesis.

Changes to the program:
The number of required lecture classes has been reduced, in order to allow students extra time to prepare for their second qualification exam, allow them to prepare and present their prospectus talk earlier, and reduce the time duration to the dissertation defense.

C1 Centers and Clusters

GSU Center for Nano-Optics (CeNO) (1.c)

A key topic of fundamental research in physics is in the area of the behavior of matter at the smallest scales of atoms and electrons. The optical and electrical properties of materials on this tiny nano-meter scale have enormous implications for our understanding of forces and processes between elementary units and for new technologies based on these principles. The GSU Department of Physics and Astronomy has a strong research heritage in theoretical and experimental investigations in condensed matter physics, and Physics and Astronomy faculty joined together to focus their expertise in the creation in 2013 of a new GSU University Research Center, the Center for Nano-Optics (CeNO) under the direction of Professor Mark Stockman. The primary goals of CeNO are to further develop the science of nano-optics at GSU and to increase awareness and funding for the field. CeNO faculty enhance and encourage the teaching of nanosciences to enrich the education of GSU students interested in this growing field.

Fundamental science research at the CeNO is concentrated on theoretical and experimental investigations in nanoplasmonics, a field of nano-optics studying metal nanoparticles and their complexes in nanostructured semiconductors and dielectrics. Areas of concentration include nanoplasmonic systems of gain, the so called spasers and nanolasers. Other directions of focus include the study of adiabatic nanofocusing of optical energy in tapered nanoplasmonic waveguides and ultrafast phenomena in nanoplasmonics, especially those in strong optical radiation fields. This basic work has technological applications in biomedical research, energy generation and conservation, information processing, and sensing devices.

The CeNO team is a leader of a $7.5 million grant from the U.S. Department of Defense Office of Naval Research Multidisciplinary University Research Initiative (MURI). CeNO scientists work in collaboration with other researchers at Yale, Purdue, Cornell, Central Florida, and UC – Berkeley. The CeNO group includes the Director, Dr. Mark Stockman, nine other faculty members, three postdoctoral associates, and a business manager. Details about CeNO are available at the website nanooptics.gsu.edu.

GSU Center for High Angular Resolution Astronomy (1.c)

Professor H.A. McAlister founded the Center for High Angular Resolution Astronomy within the College of Arts and Sciences in 1984. CHARA's goal from the start was to build a uniquely powerful telescope that would enable views of stars never before attained. That ambitious goal was achieved with the completion in 2003 of the CHARA Array at Mount Wilson Observatory in California. This remarkable instrument consists of six telescopes with one meter mirrors that are distributed in a Y-configuration over the top of Mount Wilson in the San Gabriel National Monument. Their separations correspond to baselines ranging from 30 to 330 meters, and when the light from the individual telescopes is combined, the angular resolution (ability to discern small sizes in the sky) is like that of an enormous single telescope. The Array is capable of resolving details as small as 200 micro-arcseconds, equivalent to the angular size of a nickel seen from a distance of 10,000 miles. In terms of the number and size of its individual telescopes, its ability to operate at visible and near infrared wavelengths, and its longest baseline of 330 meters, the CHARA Array is arguably the most powerful instrument of its kind in the world. No other university institution possesses a facility of comparable power.

The light beams from the telescopes of the Array converge in a Beam Combination Laboratory where six different beam combiners are used to study starlight in the optical and near-infrared. These combiners were constructed by CHARA astronomers and by members of the CHARA collaboration from the University of Michigan, the University of Sydney (Australia), the University of Paris (France), the University of Nice (France), and the University of Exeter (United Kingdom). This international collaboration brings the best scientists in the world to the CHARA Array, and they contribute to an outstanding program of observational research with the Array telescopes.

With its extraordinary ability to resolve angular detail, the CHARA Array has made scientific discoveries of an unprecedented nature. Among its 143-refereed scientific publications to date, CHARA has earned some remarkable scientific firsts. Among these are: the first images of stars that bulge out from the equators due to their rapid rotation; the first direct measurements of the pulsations of so-called "Cepheid variable stars" that are fundamental to determining the distance scale of the Universe; the first detection of hot dust around stars signaling the early phases of planet formation; the first images of an "interacting binary" in which gravitationally-paired stars with distorted shapes exchange matter from one to another; the first image of the passage of a poorly-understood dark disk across the face of its companion star during eclipse; the first images during the very early stages of a thermonuclear fireball detonation resulting from a "nova" eruption; and the first direct maps of magnetic storms (star spots) on the surface of a star other than the Sun.

This research has been continuously funded by the National Science Foundation since 1978 and has to date resulted in $27M in external support awarded to GSU from federal agencies and private foundations. Some 700 research papers, abstracts, and technical reports have been published by CHARA investigators, and 18 astronomy doctoral degrees have been awarded at GSU to graduate students pursuing CHARA research.

Two large programs are now underway that will greatly enhance CHARA's scientific mission. First is the construction of new adaptive optics systems that will act to remove the image distortion caused by turbulence in the atmosphere and by the optical elements of the Array. These improvements in beam quality will lead to much improved efficiency of operations and greater ability to record fainter targets. The second initiative is a program to create open access to the Array for astronomers from around the nation and around the world. Proposals for some 100 nights per year of observations with the Array are selected by peer review through biannual competitions administered by the U.S. National Optical Astronomy Observatory.

The CHARA organization consists of CHARA Director Dr. Douglas Gies and a business manager on the GSU campus, Ms. Alicia Rice, and ten staff members at Mount Wilson led by Director of the CHARA Array Dr. Theo ten Brummelaar. Details about the CHARA Array are available at the website www.chara.gsu.edu.

Georgia AstroInformatics Nexus (GAIN) (1.c)

The Department of Physics and Astronomy and the Department of Computer Science won a GSU Second Century Initiative (2CI) award in 2011 for faculty growth in the area of "Stellar Astrophysics and Astroinformatics" (under the direction of Dr. H. A. McAlister). This award recognized the growth potential in areas related to big data science collection and computationally intensive methods of analysis, and it helped launch an important collaborative effort between faculty members in the GSU Department of Computer Science and Department of Physics and Astronomy. This 2CI award led to four senior faculty hires. The first new faculty addition (2012) was Dr. Sébastien Lépine (Physics and Astronomy) who is a world leader in studies of stellar populations in our Galaxy, and in particular, the tiny apparent motions of stars across the sky. The second hire (2013) was Dr. Rafal Angryk (Computer Science), an innovative scholar in the development of computer analysis tools of images with a special emphasis on temporal changes on the surface of the Sun. The third hire (2014) was Dr. Petrus Martens (Physics and Astronomy), a long-time collaborator with Dr. Angryk. Dr. Martens is a leading expert on solar physics with long-term interests in space observations of the Sun and its out-flowing solar wind. The fourth hire (2016) was Dr. Stuart Jefferies (Physics and Astronomy) who is an instrument developer with interests in high angular resolution imaging and long, time series observations of the Sun from the South Pole (http://news.gsu.edu/2017/03/15/following-sun-end-earth/).

This core group developed a vision of future growth that would help connect trends in computer science with the needs of new NASA missions and with the developments in high angular resolution imaging with the CHARA Array. The primary need is for junior faculty who can help this program grow through the mentorship of the cluster team. A second initiative was launched in response to the GSU Next Generation Faculty program that led to an award for "Astroinformatics: the Solar-Stellar Connection" (led by Dr. Angryk, Computer Science). The first hires under this new award began in the Fall 2017 semester, and they include junior faculty members Dr. Jane Pratt (Physics and Astronomy), Dr. Daniel Pimentel-Alarcon (Computer Science), and Dr. Juan Banda (Computer Science) and a postdoctoral associate Dr. Robert Klement (CHARA). A search is underway to add a Research Scientist position to the group. The research cluster has adopted the name of Georgia AstroInformatics Nexus (GAIN; gain.gsu.edu), and it now includes seven faculty members, four postdoctoral associates, and ten graduate students. GAIN is poised for major research initiatives in big data, imaging, surveys, and studies of magnetic activity in the Sun and other stars.

C2 Grants

Awards by Sponsor Type (APR Dashboard) (1.c.1.2.a)

Sponsor Type	FY2013	FY2014	FY2015	FY2016	FY2017
Federal	$1,802,944	$2,446,478	$3,638,264	$4,259,835	$6,949,557
Foreign	$4,910	$0	$0	$0	$14,000
Georgia Flow Through	$56,146	$12,000	$10,500	$10,500	$10,500
Industry	$0	$0	$0	$76,217	$78,126
Industry Flow Through	$0	$0	$0	$0	$14,383
Non-Profit	$287,978	$372,680	$309,135	$200,893	$105,146
Non-Profit Flow Through	$28,877	$31,157	$54,386	$30,414	$402,349
Other States	$32,000	$0	$0	$0	$0
Other States Flow Through	$0	$0	$19,280	$0	$0
CeNO Awards	$243,000	$979,331	$2,657,831	$2,175,238	$1,703,432
Total Award Amount	$2,455,855	$3,841,646	$6,689,396	$6,753,097	$9,277,493

Awards by Purpose (APR Dashboard)

Purpose	FY2013	FY2014	FY2015	FY2016	FY2017
Applied Research	$131,232	$0	$246,846	$0	$0
Basic Research	$2,298,145	$3,736,903	$6,334,517	$6,644,651	$9,181,493
Fellowships	$0	$0	$0	$2,000	$96,000
Instruction	$0	$91,076	$99,633	$99,946	$0
Other	$0	$0	$0	$2,500	$0
Public Service	$0	$13,667	$8,400	$0	$0
Student Services	$26,478	$0	$0	$4,000	$0
Total Award Amount	$2,455,855	$3,841,646	$6,689,396	$6,753,097	$9,277,493

Grants Success Ratio (1.c.1.2.b)

Fiscal Year	Proposals	Awards	Success Ratio
2013	25	13	52.0
2014	36	13	36.1
2015	53	16	30.2
2016	33	7	21.2
2017	21	7	33.3

List of Individual Grants 2012 – present (1.c.1.2.a)

Start	End	Award	Sponsor Name	PI Name
9/15/10	8/31/16	539,737	National Science Foundation	Dhamala,Mukeshwar
1/1/12	12/31/13	60,510	National Aeronautics & Space	Gies,Douglas Russell
1/1/12	7/31/16	49,450	American Astronomical Society	Gies,Douglas Russell
2/1/12	1/31/17	32,468	Space Telescope Science Institute	Jao,Wei-Chun
4/1/12	3/31/13	5,200	Academy of Applied Science	Manson,Steven T
4/1/12	3/10/16	301,406	Qatar National Research Fund	Hastings,Gary
5/1/12	4/30/16	33,676	Space Telescope Science Institute	Gies,Douglas Russell
6/1/12	7/31/17	132,000	National Science Foundation	Cabrera,Nicole E
6/1/12	12/31/12	12,000	University of Southern California	Gies,Douglas Russell
6/15/12	6/14/16	343,004	Army Research Office	Perera,Unil A G
8/1/12	6/30/14	24,250	Jet Propulsion Laboratory	Schaefer,Gail
8/1/12	7/31/18	363,078	National Science Foundation	Perera,Unil A G
8/1/12	7/31/13	4,910	Universite Joseph Fourier	Cabrera,Nicole E
8/1/12	7/31/18	1,512,116	National Science Foundation	Mcalister,Harold Alister
8/15/12	7/31/17	410,091	National Science Foundation	Baron,Fabien Robert
9/1/12	8/31/16	447,390	National Science Foundation	Crenshaw, D. Michael
10/1/12	9/30/16	81,406	Illinois Wesleyan University	Henry,Todd J
11/1/12	10/31/16	70,760	Space Telescope Science Institute	Henry,Todd J
11/1/12	4/30/14	20,000	University of California Santa Barbara	Kozhanov,Alexander
1/1/13	6/30/15	67,927	National Aeronautics & Space	Gies,Douglas Russell
1/1/13	12/31/13	39,193	Georgia Institute of Technology	Thoms,Brian Douglas
1/1/13	6/30/15	48,385	National Aeronautics & Space	Gies,Douglas Russell
2/1/13	1/31/14	3,600	Sigma Xi	Winters,Jennifer Gwyn
2/1/13	1/31/15	26,478	National Radio Astronomy Observatory	Bentz,Misty Cherie
4/1/13	12/31/13	2,600	Academy of Applied Science	Manson,Steven T
5/15/13	5/31/18	862,769	National Science Foundation	Bentz,Misty Cherie
6/1/13	5/31/16	79,286	National Science Foundation	Quinn,Samuel Noah
6/1/13	8/31/17	4,502,171	Office of Naval Research	Stockman,Mark I
6/17/13	7/31/18	8,400	National Science Foundation	Perera,Unil A G
8/1/13	7/31/18	316,488	National Science Foundation	Apalkov,Vadym M

8/1/13	7/31/16	290,655	American Physical Society	Thoms,Brian Douglas
8/1/13	7/31/18	81,247	Space Telescope Science Institute	Bentz,Misty Cherie
8/15/13	8/31/18	242,000	Department of Energy	Sarsour,Murad G
8/31/13	8/31/16	81,498	National Science Foundation	Lepine,Sebastien
10/1/13	9/30/15	50,000	Jet Propulsion Laboratory	Ten Brummelaar,Theo
12/1/13	11/30/14	29,854	Space Telescope Science Institute	Lepine,Sebastien
1/1/14	12/31/18	180,962	National Science Foundation	Von Korff,Joshua S.
2/1/14	1/31/17	13,153	Space Telescope Science Institute	Bentz,Misty Cherie
2/1/14	9/30/15	12,750	Jet Propulsion Laboratory	Schaefer,Gail
4/1/14	12/31/14	4,000	Academy of Applied Science	Manson,Steven T
5/1/14	5/31/15	2,400	Sigma Xi	Winters,Jennifer Gwyn
5/12/14	11/11/15	22,500	Army Research Office	Perera,Unil A G
6/1/14	11/30/15	12,600	Army Research Office	Perera,Unil A G
6/24/14	6/30/15	351,733	Department of Defense	Briggs,Richard Wallace
7/15/14	1/14/17	16,000	Jet Propulsion Laboratory	Schaefer,Gail
8/1/14	7/31/18	402,342	National Science Foundation	Gies,Douglas Russell
8/16/14	9/30/15	19,280	California State University - Long Beach	Abate,Yohannes
9/1/14	4/30/18	339,885	Army Research Office	Mani,Ramesh Ganapathi
9/1/14	8/31/17	481,104	National Science Foundation	Henry,Todd J
9/1/14	8/31/18	1,178,526	National Aeronautics & Space	Martens,Petrus Cornelis
12/1/14	11/30/17	66,034	Space Telescope Science Institute	Bentz,Misty Cherie
12/8/14	2/7/18	407,074	Department of the Army	Perera,Unil A G
12/11/14	12/10/15	2,500	citizens united for research in epilepsy	Dhamala,Mukeshwar
12/15/14	12/14/17	456,000	University of Central Florida	Stockman,Mark I
12/17/14	9/30/17	131,750	Brookhaven National Laboratory	He,Xiaochun
1/1/15	12/31/15	4,000	Academy of Applied Science	Manson,Steven T
1/1/15	12/31/17	33,334	Research Corporation for Science Advance	Abate,Yohannes
1/1/15	12/31/17	16,689	Space Telescope Science Institute	Gies,Douglas Russell
1/29/15	7/31/17	16,000	Jet Propulsion Laboratory	Schaefer,Gail
2/1/15	1/31/18	25,760	Space Telescope Science Institute	Gies,Douglas Russell
3/1/15	2/28/18	67,544	Space Telescope Science Institute	Henry,Todd J
5/1/15	4/30/17	26,000	Department of Energy	Sarsour,Murad G
5/1/15	4/30/18	466,958	National Aeronautics & Space	Martens,Petrus Cornelis

6/1/15	5/31/17	56,773	National Science Foundation	Quinn,Samuel
7/6/15	7/5/18	21,000	Georgia Institute of Technology	Gies,Douglas Russell
8/1/15	7/31/19	17,502	National Science Foundation	Ten Brummelaar,Theo
8/17/15	8/16/17	154,343	Riken	Connors,Megan
8/21/15	8/20/17	396,738	Army Research Office	Mani,Ramesh Ganapathi
8/29/15	8/28/17	100,000	National Aeronautics & Space	Lepine,Sebastien
9/1/15	8/31/18	381,263	National Science Foundation	White,Russel Joseph
9/1/15	8/31/20	2,000	National Science Foundation	Cabrera,Nicole
9/1/15	8/31/18	1,118,494	National Science Foundation	Ten Brummelaar,Theo
10/1/15	9/30/18	243,528	National Science Foundation	Henry,Todd J
11/1/15	10/30/18	270,000	Department of Energy	Manson,Steven T
11/4/15	4/15/16	3,000	Georgia State University Research	Barrett,Albertha White
1/1/16	12/31/18	76,899	Space Telescope Science Institute	Crenshaw,D. Michael
1/20/16	12/31/16	4,000	Academy of Applied Science	Manson,Steven T
2/1/16	7/14/18	751,526	University of Hawaii	Jefferies,Stuart
2/4/16	2/4/16	36,608	Georgia State University Research	Barrett,Albertha White
2/12/16	9/30/18	679,737	Pacific Northwest National Laboratory	Dietz,Nikolaus
3/1/16	2/28/18	209,768	National Science Foundation	Abate,Yohannes
5/15/16	5/14/17	163,322	National Aeronautics & Space	Munoz Jaramillo,Andres
6/1/16	5/31/19	45,084	Space Telescope Science Institute	Gies,Douglas Russell
6/1/16	5/31/18	290,142	Air Force Office of Scientific Research	Dietz,Nikolaus
6/1/16	5/31/18	96,000	National Science Foundation	Revalski,Mitchell
7/1/16	6/30/17	20,000	National Aeronautics & Space	Jao,Wei-Chun
7/1/16	6/30/18	99,965	National Aeronautics & Space	Lepine,Sebastien
7/1/16	6/30/18	247,726	National Science Foundation	Baron,Fabien Robert
7/1/16	6/30/18	29,873	National Aeronautics & Space	Lepine,Sebastien
7/29/16	6/30/18	15,000	Jet Propulsion Laboratory	Schaefer,Gail
8/1/16	7/30/19	420,000	Air Force Office of Scientific Research	Abate,Yohannes
8/19/16	8/18/17	387,458	Army Research Office	Abate,Yohannes
9/1/16	8/31/21	3,902,331	National Science Foundation	Ten Brummelaar,Theo
9/21/16	9/21/20	70,000	Georgia State University Research	Barrett,Albertha White
10/1/16	3/31/19	40,000	Kyoto Sangyo University	Ten Brummelaar,Theo
12/1/16	11/30/18	6,244	Emory University	Krishnamurthy,Lisa

1/1/17	12/31/19	46,617	Space Telescope Science Institute	Gies,Douglas
1/1/17	12/31/17	2,500	Sigma Xi	Silverstein,Michele
1/12/17	1/11/18	14,383	Assoc of Univ for Research in Astronomy	Martens,Petrus
3/8/17	6/30/18	125,000	Georgia State University Research	Barrett,Albertha White
6/1/17	5/31/19	1,653,228	Office of Naval Research	Stockman,Mark
8/1/17	7/31/20	320,418	National Science Foundation	Mani,Ramesh
8/1/17	7/31/18	55,000	National Science Foundation	Connors,Megan
8/14/17	6/30/18	10,000	Emory University	Dhamala,Mukeshwar
9/1/17	8/31/18	214,125	Department of Energy	Hastings,Gary
9/1/17	8/31/20	495,997	National Science Foundation	Henry,Todd
9/1/17	8/31/21	256,349	National Science Foundation	Gies,Douglas
9/11/17	9/10/18	451,008	Department of Defense	Mani,Ramesh

Note: Amounts shown for current grants are generally those expended to date or the budgeted amount through FY18; these amounts are less than the total awards.

C3 Publication Statistics

Publication Summary

Academic Year	Type	Book	Book Chap.	PR Proc.	PR Jour.	NPR Jour.	Other	Dept Total
2012-2013	TT	0	4	2	94	7	70	177
	NTT	0	2	0	23	7	15	47
AY Total		0	6	2	117	14	85	224
2013-2014	TT	1	6	2	93	11	64	177
	NTT	0	1	0	11	13	19	44
AY Total		1	7	2	104	24	83	221
2014-2015	TT	0	2	1	99	13	71	186
	NTT	0	0	0	14	9	22	45
AY Total		0	2	1	113	22	93	231
2015-2016	TT	0	1	1	93	26	83	204
	NTT	0	0	0	8	6	11	25
AY Total		0	1	1	101	32	94	229
2016-2017	TT	0	1	1	54	22	50	128
	NTT	0	0	0	5	9	6	20
AY Total		0	1	1	59	31	56	148
Total		1	17	7	494	123	411	1053

Type indicates author status: TT=Tenured/Tenure-Track, NTT=non-Tenured/Tenure-Track. PR=peer reviewed, NPR=non-peer reviewed. Note that counts for 2016-2017 are incomplete because reporting to Digital Measures for calendar year 2017 will only occur in January 2018.

Faculty Publication Results

	Lifetime				2014-2016			
Faculty	#papers	#citations	h-index	Source	#papers	#citations	h-index	Source
Abate	19	195	9	WOS	5	47	3	WOS
Apalkov	212	3515	27	GS	18	163	7	WOS
Baron	79	1031	17	ADS	23	207	8	ADS
Bentz	96	4299	36	ADS	22	472	13	ADS
Connors	186	2516	41	WOS	116	1087	26	WOS
Crenshaw	228	7838	51	ADS	16	257	8	ADS
Dhamala	40	2595	21	GS	10	56	5	WOS
Dietz	203	3774	37	WOS	18	40	3	WOS
Gies	287	7893	43	ADS	28	306	9	ADS
Hastings	56	464	13	WOS	5	36	4	GS
He	224	20016	78	WOS	36	364	13	WOS
Henry	177	8700	44	ADS	21	296	11	ADS
Jefferies	150	2716	25	ADS	13	2	1	ADS
Kozhanov	28	112	6	ADS	6	9	2	WOS
Kuzio de Naray	28	1040	12	ADS	7	190	3	ADS
Lepine	143	9325	37	ADS	25	347	11	ADS
Mani	95	2117	22	ADS	10	13	4	WOS
Manson	398	9441	46	GS	19	44	5	WOS
Martens	159	2849	28	ADS	7	30	3	ADS
Perera	175	4212	34	GS	19	47	4	WOS
Sarsour	117	5407	41	WOS	30	328	12	WOS
Stockman	340	15257	55	GS	25	245	9	WOS
Thoms	28	506	12	ADS	2	4	2	WOS
Von Korff	27	172	8	ADS	14	71	10	WOS
White	32	6634	37	GS	10	43	3	ADS

This table lists the number of articles, paper citations, and h-index for the full career and last full three years for Physics and Astronomy faculty. The final column lists the source of the information quoted here. The source for the astronomy faculty is the NASA Astrophysics Data System (ADS) that includes complete data for decades as well as statistical summaries. The situation is more difficult for the physics faculty. We used the Web of Science (WOS) for the 2014 – 2016 period, but it is incomplete for earlier years. Where available we gathered the full career data for the physics faculty from Google Scholar (GS), which is not complete but shows the basic trends.

Impact factors for Astronomy Journals

Journal	Impact Factor	Discipline
Nature	40.13	General
Astrophysical Journal Supplemental Series	12.36	Astronomy
The Astrophysical Journal	6.09	
Astrophysical Journal Letters	5.66	
Monthly Notices of the Royal Astronomical Society	5.15	
Astronomy and Astrophysics	4.78	
The Astronomical Journal	4.05	
Publications of the Astronomical Society of the Pacific	3.86	
Solar Physics	3.33	
Icarus	3.11	
Research in Astronomy and Astrophysics	1.43	
Astronomische Nachrichten	1.06	
Astronomy and Computing	2.01	Computing
Journal of Space Weather and Space Climate	2.60	Space Weather
ACM Transactions in Spatial Algorithms Systems	1.90	Algorithms
Inverse Problems	1.66	Math
Journal of Astronomical Telescopes and Systems	3.50	Optics
Optics Express	3.52	
Optics Letters	3.26	

Note: Impact factors represent average value over period 2012-2016

Impact factors for Physics Journals

Journal	Impact Factor	Discipline
Nature	40.14	General
Reviews of Modern Physics	36.92	Physics
Reports on Progress in Physics	14.33	Physics
Light-Science & Applications	14.10	Photonics
Nano Letters	8.81	Nanoscience
Physical Review Letters	8.46	Physics
ACS Applied Materials & Interfaces	7.50	Electronic/optical materials
Journal of High Energy Physics	6.06	Nuclear physics
European Physical Journal C	5.33	Physics
Physics Today	4.86	Physics
Physics Letters B	4.81	Nuclear physics
Brain Connectivity	3.83	Neuroscience
Physical Review C	3.82	Nuclear physics
Frontiers in Systems Neuroscience	3.79	Neuroscience
Advanced Materials Interfaces	3.37	Electronic/optical materials
Applied Physics Letters	3.30	Physics
Physical Review D	3.02	Nuclear physics
IEEE Photonics	2.29	Photonics
Solid State Sciences	1.81	Materials
Physics Letters A	1.77	Physics
European Physical Journal Plus	1.75	Physics
Physical Review Physics Ed. Research	…	Teaching

Note: Impact factors represent current value.

Physics Patents

ISSUED PATENTS:

Unil Perera

1. “High Operation Temperature Split-Off Band Infrared Detectors”, Canada Patent # CA 2662526 A1, issued on 12/22/2015.
2. "High operating temperature split-off band infrared detector with double and/or graded barrier", (A. G. U. Perera and S.G. Matsik) U. S. Patent No.8530,995, issued on 9/10/2013
3. "Three terminal UV-IR dual Band Photodetectors", (A. G. U. Perera and S.G. Matsik) Serial No: 12/907518, issued on 10/27/2011
4. "Dual Band Photodetector", (A. G. U. Perera and S.G. Matsik) U. S. Patent No.7838869, issued on 11/23/2010.
5. "High Operating Temperature SPLIT-OFF Band Infrared Detectors", (A. G. U. Perera and S. G. Matsik) U. S. Patent No. 7786508, issued on 8/31/2010.
6. " Heterojunction Far Infrared Detector", (A. G. U. Perera, and S. G. Matsik) U. S. Patent No. 7253432, issued on 8/7/2007.
7. "New Extrinsic Semiconductor Infrared Detectors", (D. D. Coon, R. P. Devaty, A. G. U. Perera and R. E. Sherriff) U.S. Patent No. 5030831, issued on 7/9/1991.

Nikolaus Dietz

8. "High Pressure Chemical Vapor Deposition Apparatuses, Methods, and Compositions Produced Therewith," Nikolaus Dietz; U.S. Patent No. 9,243,329, issued 1/26/2016, priority date 8/12/2009.

Ramesh Mani

9. Offset voltage compensated Hall-effect device, R. G. Mani and K. von Klitzing, German Patent Registration, P.4304279.6, P.4308375.7 (1993).
10. Hall effect device with current and Hall-voltage contacts, R. G. Mani and K. von Klitzing, PCT registration EP 94/00701; European Patent (France, UK, and Germany) EP0689723; U.S.A. Patent #5,646,527; Japanese Patent Registration HEI-6-519,590; Korean Patent Registration 703,831/95.
11. Method for compensating the piezoresistive offset voltage in doubly connected Hall-effect devices based on Silicon, R. G. Mani and K. von Klitzing, European Patent EP0704710B1, U. S. Patent #6,008,643.

PATENT APPLICATIONS FILED (PENDING):

Unil Perera

1. ATR-FTIR for Non-Invasive Detections of Colitis", (A. G. U. Perera, J. Titus, D. Merlin, and E. Viennois), Application Number # 62/175,050, application submitted to the U.S. Patent and Trademark Office, 6/12/2015.
2. "Tunable Hot Carrier Photodetector" (A. G. U. Perera and Y. F. Lao), International Publication Number # 2015/069367A2, 5/14/2015.
3. "Early Detection of Cell Activation By ATR-FTIR Spectroscopy", (A. G. U. Perera, J. Titus, C. Filfili, J. K. Hilliard) application submitted to the U.S. Patent and Trademark Office, 12/3/2013.

Nikolaus Dietz

4. "Incoherent Type-III materials for charge carriers control devices," Raphael Tsu, Nikolaus Dietz and Ian T. Ferguson, Application # 61/770,037, Priority date 2/ 27/2013; WO/2011/019920 , publication date 4/9/2014.

C4 Professional service

- Dr. Gies concluded seven years of service as Scientific Editor of the Astrophysical Journal (2015).
- Dr. Stockman was also appointed an Editor of Light: Science and Applications and a Visiting Professor in the Chinese Academy of Sciences (2015).
- Dr. Rachel Kuzio de Naray became an executive member of the AAS Division on Dynamical Astronomy (2015).
- Dr. Steve Manson was appointed to a Fellowship Committee for the American Physical Society (2015).
- Dr. Piet Martens and Dr. Rafal Angryk were invited to the White House for a conference to discuss preparedness for space weather (2016).
- Dr. Sébastian Lépine and Dr. Russel White hosted an international conference, "IAUS 314: Young Stars and Planets near the Sun", on the GSU campus (2016).
- Dr. Mukesh Dhamala and his group organized an international conference at GSU titled "BrainModes 2015".
- The Nuclear Physics faculty (Drs He, Sarsour and Connors) organized a national workshop on the Hadronic Calorimeter Detector, a part of Brookhaven National Laboratory, on the GSU campus (2016).
- Dr. Rachel Kuzio Naray discussed a recent discovery of earth-like planets and the possibility of extraterrestrial life on a GPB TV show (2016).
- Dr. Murad Sarsour and graduate student Hari Guragain were on Brookhaven National Laboratory newsroom, and Dr. Megan Connors was featured in an article on the upcoming new instrument sPHENIX (2016).
- Dr. Misty Bentz wrote a post for the Women in Astronomy blog, which was republished on the Times Higher Education page (2016).
- The Nuclear Physics faculty (Drs He, Sarsour and Connors) held the 3rd sPHENIX collaboration meeting at GSU (2017).
- Dr. Piet Martens organized the Georgia Regional Astronomy Meeting, which included astronomers from many institutions in Georgia (2017).
- Dr. Mike Crenshaw was appointed Chair of the Board of Governors of the Astrophysical Research Consortium (ARC) (2017).
- Professor Stuart Jeffries was featured on the GSU home page as leading a multi-institutional crew of scientists opening a solar observatory in the most inhospitable place on the planet – Antarctica (2017).
- Dr. Yohannes Abate joined the Editorial Board of Scientific Reports, a Nature publication (2017).
- Dr. Ben McGimsey, Dr. Douglas Gies and Dr. John Wilson organized solar eclipse activities on campus and in the total eclipse region at the Rabun Gap – Nacoochee School; both events attracted over 10,000 visitors (2017).

C5 Faculty awards

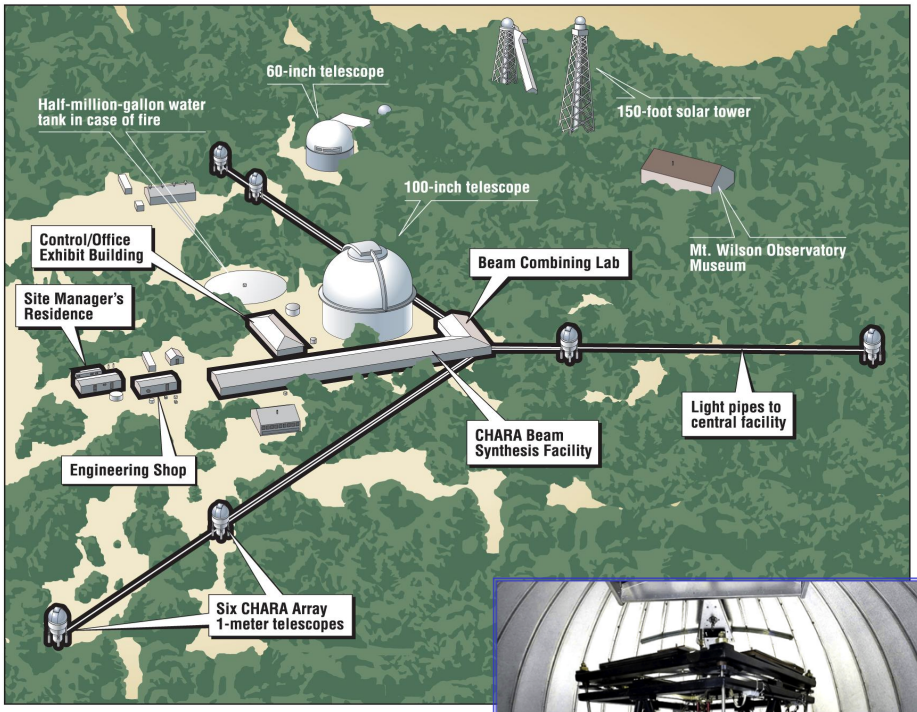
- Dr. Mark Stockman was appointed GSU Distinguished University Professor (2015).
- Dr. Yohannes Abate won a prestigious 5-year National Science Foundation CAREER awarded (2016).
- Dr. Michael Crenshaw was appointed GSU Distinguished University Professor (2015).
- GSU Scientists at CHARA, under the leadership of Dr. Theo ten Brummelaar and Dr. Douglas Gies, received a $3.9M NSF grant award to expand access to the CHARA Array to the astronomical community (2017).
- GSU's program on physics teacher education, under the leadership of Dr. Brian Thoms, continues to be recognized as a national leader with GSU's membership in the 5+ Club of the American Physical Society and the American Association of Physics Teachers (2017).
- Dr. Brian Thoms received the 2017 College of Arts and Sciences Outstanding Undergraduate Director Award (2017).
- Dr. Douglas Gies was awarded permanent status as Regents' Professor (2017).
- Dr. Douglas Gies won the GSU Alumni Distinguished Professor Award (2017).
- Dr. Fabien Baron won the Dean's Early Career Award (2017).

D1 Laboratory Resources

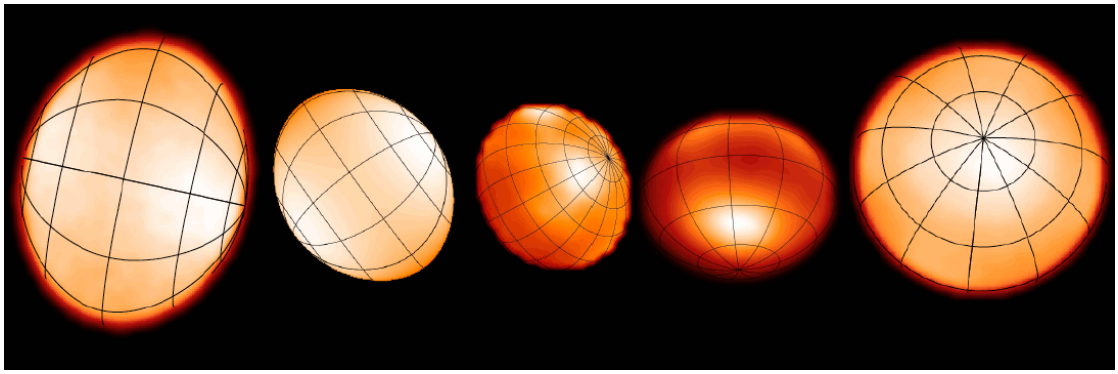
The department has the following facilities available for research. Each one is described in the following pages:

- Astronomy Facilities
  - CHARA Array
  - Apache Point Observatory
  - SMARTS
  - Hard Labor Creek Observatory
  - South Pole Solar Observatory
  - Consortium for Innovative Optical Systems
- Condensed Matter Facilities
  - Advanced Materials Epitaxy Laboratory
  - Nano-Optics Laboratory
  - Nanoscale, Low Temperature, and High Magnetic Field Laboratory
  - Semiconductor Optoelectronics Laboratory
  - Spin Dynamics Laboratory
- Molecular and Cellular Biophysics Facilities
- Neurophysics Facilities
- Nuclear Physics Facilities
  - Cosmic Ray / Nuclear Physics Laboratory
  - Relativistic Heavy Ion Collider
- Physics and Astronomy High Performance Computing
- Physics and Astronomy Instrument Shop
- Physics Education Research Enhanced Classrooms

Astronomy Facilities: CHARA Array Optical/IR Long Baseline Interferometer

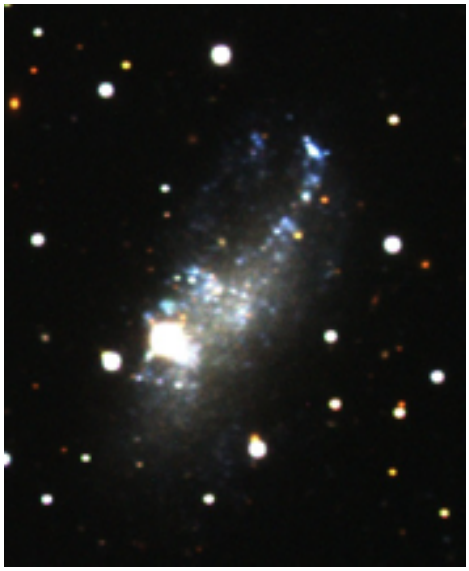


GSU operates the CHARA Array, the largest optical long baseline interferometer in the world. The Array consists of six 1 m telescopes arranged in a Y-configuration at the Mount Wilson Observatory in the San Gabriel National Monument of southern California. With baselines as large as 330 m, the Array resolves objects smaller than one milliarcseconds, revealing the shapes, surfaces, and environments of stars for the first time.



Astronomy Facilities: Apache Point Observatory

Georgia State University is a full member of the Astrophysical Research Consortium (ARC) that owns and operates Apache Point Observatory (APO) in Sunspot, NM. GSU astronomers have a 1/16th share of the Observatory telescope time, equivalent to 39 half-nights per year.



APO is located 9,147 feet above sea-level under the dark, dry skies of the Sacramento Mountains in the southwestern United States. There is a collection of telescopes on the mountaintop, and GSU astronomers have access to two of these: the 3.5-meter and the 0.5-meter.

The large aperture of the 3.5-meter telescope, combined with the available instruments and favorable sky conditions, makes it possible for GSU astronomers to observe very faint and distant objects in the universe. GSU astronomers use this world-class research facility to study a diverse range of phenomena including: distant galaxies, dark matter, black holes, and stars in our own Milky Way.

Usage Statistics:

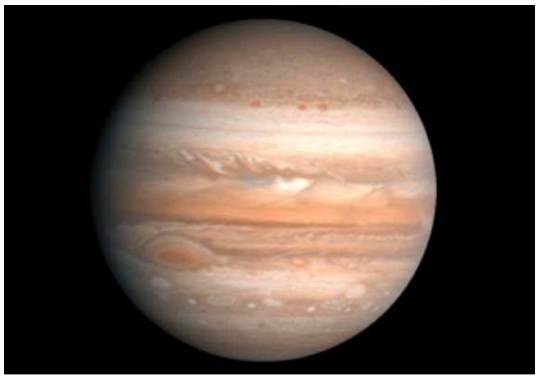
- 60% of GSU Astronomy Faculty
- 100% of GSU Astronomy Postdocs
- 40% of GSU Astronomy Graduate Students
- 2 GSU Astronomy Concentration Undergrads
- 7 on-site visits for student training

Astronomy Facilities: The SMARTS Initiative

GSU has been a partner in the SMARTS (Small and Moderate Aperture Research Telescope System) Consortium since its inception in 2003, operating four telescopes at CTIO, near La Serena, Chile. GSU's SMARTS membership is supported by the University Research Services and Administration (URSA) at a level of $50,000/year, an amount supplemented by Department and grant funds.

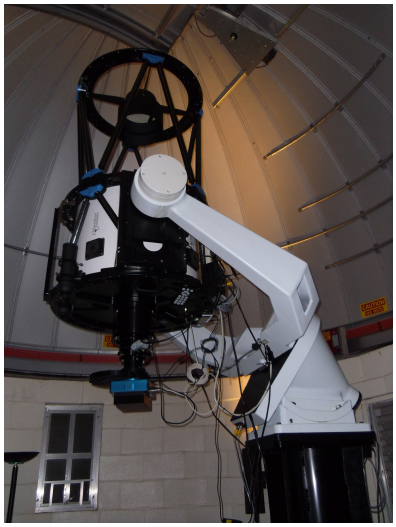
Members of the RECONS group lead the operations for two of the telescopes. The 0.9m (right) is used for imaging work, where astrometry, photometry, and variability studies are carried out at optical wavelengths using a CCD camera. The 1.5m is equipped with the CHIRON high-resolution spectrograph that covers wavelengths from 4200 to 8800Å, where stellar characterization work - abundances, activity, and space motions - is done, and spectroscopic binary orbits are mapped.

Both the 0.9m and 1.5m are being used to search for stellar, brown dwarf, and planetary companions to nearby stars. At the 0.9m, a unique long-term astrometry program ongoing since 1999 is able to detect planets as small as half the mass of Jupiter around red dwarfs like Proxima Centauri. The same data are also being used to follow the stellar cycles of red dwarfs that last more than a decade, science never done before. At the 1.5m, a spectroscopic program began in June 2017 to detect companions to K dwarfs down to Jupiter masses. Together, GSU astronomers gain access to these two telescopes for more than 100 nights/year.



Membership in SMARTS from 2003-2016 has allowed 54 members of the GSU Department of Physics & Astronomy to benefit from data acquired at all four of the SMARTS telescopes. Thirty-one of these GSU faculty, postdocs, graduate students, and undergraduates have had the opportunity to travel to Chile to use the facilities at this world-class observatory, thereby gaining hands-on observing experience. In addition to refereed publications, invited talks, Masters theses, and PhD dissertations, the SMARTS effort has resulted in more than $4.5M in external funding to date.

Astronomy Facilities: Hard Labor Creek Observatory



GSU's Hard Labor Creek Observatory is a teaching, research, and outreach facility located under the dark night skies of Rutledge, Georgia, in Hard Labor Creek State Park.

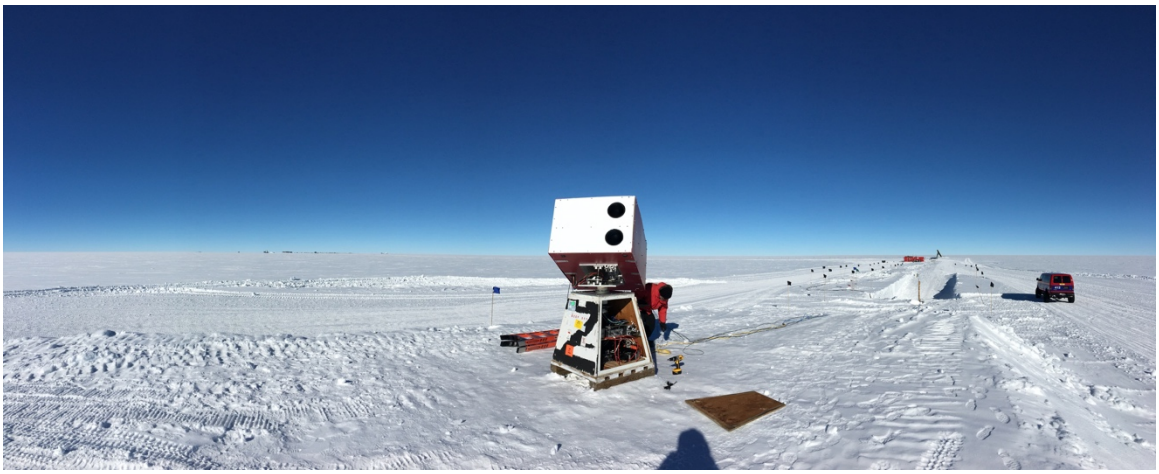
The Observatory is home to two large telescopes for research programs, and a collection of smaller telescopes for public viewing. All of the telescopes are used during free monthly open houses that attract hundreds of visitors on clear nights during the warmer months.

Recent investments of $30k in Student Technology Fees have modernized the equipment, allowing the observatory to become a critical training facility for GSU students. Between 2014-2016, 36 undergraduate and graduate students were trained there in professional astronomical observing methods as part of their coursework in ASTR 4100 and ASTR 6100.

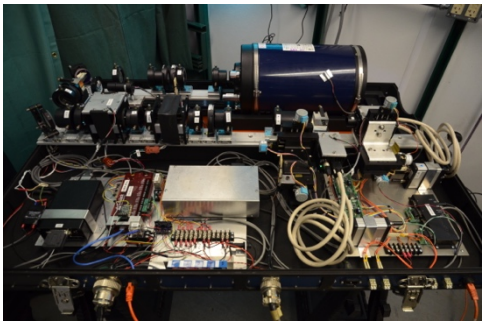
Outreach events and partners:

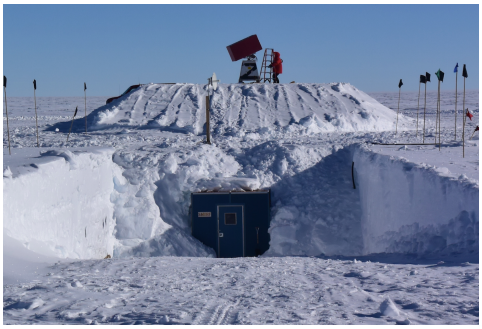
- Monthly free open houses
- Atlanta Science Festival
- Girl Scouts of Greater Atlanta
- Buddhist Summer Camp
- Astronomy Club star parties

Astronomy Facilities: South Pole Solar Observatory



GSU is the lead institution of a multi-institutional team[1] in the operation of the South Pole Solar Observatory, located 5 km away from the United States Amundsen-Scott South Pole Station in Antarctica. The observatory currently supports two Doppler-magnetograph instruments that are operated during the austral summer (November to January). These instruments allow GSU researchers to seismically probe the solar interior and atmosphere. The program is supported by a $1M award from the National Science Foundation.





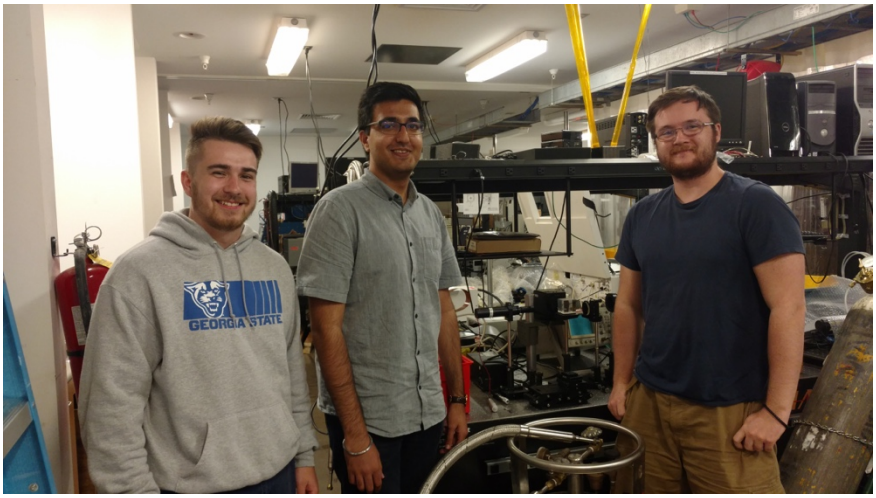
Future plans include using the observatory as a research facility for GSU graduate students' PhD dissertation work, and expanding the research studies to include seismic mapping of the interior of the giant planets, Jupiter and Saturn, during the austral winters.

[1] GSU, Jet Propulsion Laboratory, University of Rome Tor Vergata, University of Hawaii, and the European Space Agency.

Astronomy Facilities: Consortium for Innovative Optical Systems (CIOS)

GSU is a member of CIOS, a consortium dedicated to the development of optical and infrared technologies for a wide range of applications, including ground- and space-based remote sensing, energy, and related applied scientific research. CIOS is based at the University of Hawaii's Advanced Technology Research Center (UH/ATRC) on Maui.

As a member of CIOS, GSU faculty and students have access to the both the optics laboratory at the UH/ATRC and the UH observing facilities on Mount Haleakala. CIOS supported summer internships for three GSU students in 2017 (signature experiences for 2 undergraduates and a graduate).



Under CIOS, GSU and UH researchers are investigating merging advanced imaging techniques with the development of lightweight, large aperture, telescopes to enable the next-generation of ultra high-resolution imaging telescopes.

Condensed Matter Facilities: Advanced Materials Epitaxy Laboratory

Dr. Dietz established AMEL to enable a multidisciplinary environment for the development of advanced group III-N materials and device structures for the next generation of high-power or high-frequency (GHz-THz) electronics, sensitive detection systems, magnetic and nonlinear materials, and optoelectronic LED's and laser elements tunable from the IR to the deep UV region. His expertise is in the growth of high-quality III-nitrides, and he developed the first high-pressure chemical vapor deposition system (HPCVD) for the growth of In-rich group III-Nitride epilates. Dr. Dietz's expertise extends to the growth of novel optoelectronic semiconductors; heteroepitaxy of group III-phosphide compounds and birefringent chalcopyrite semiconductors, using CBE, MOCVD, HPCVD with advanced process control, real-time monitoring, and linear/nonlinear analysis of optical materials properties.

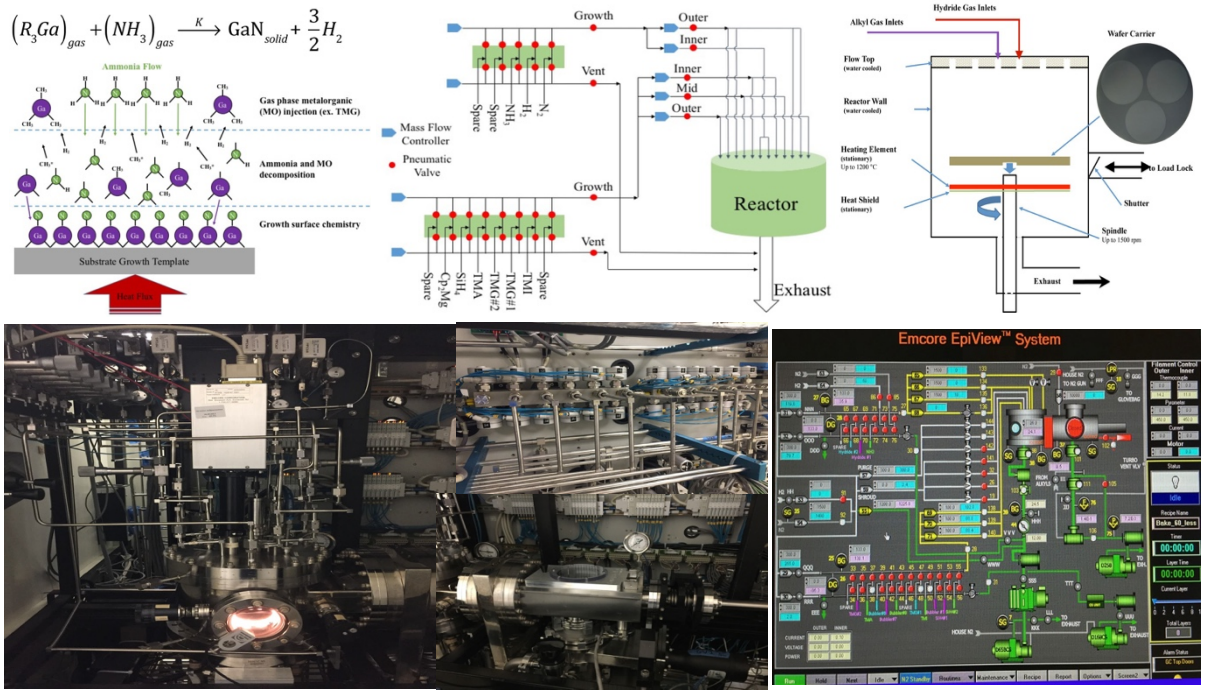
The 1600 square foot AMEL growth facility provides:

a) Low- and high-pressure MOCVD, and plasma-assisted CVD reactors with embedded real-time growth diagnostics needed for the development of advanced materials;

b) Adjacent characterization tools (Raman, FTIR, microscopes, spectroscopic reflectance, PL, ...) for quick turn-around materials analysis;

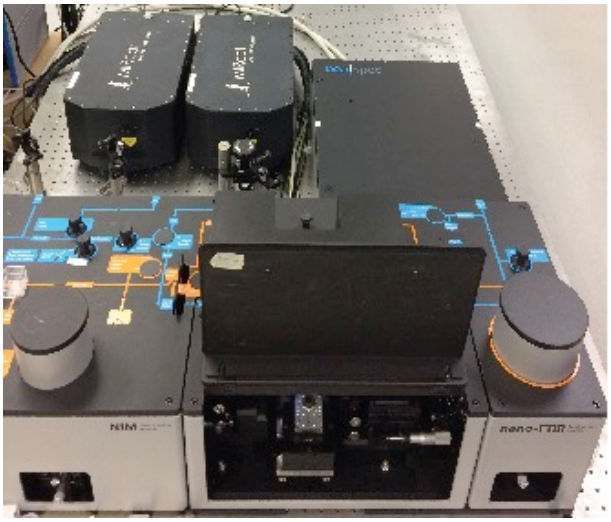
c) Cross-disciplinary training for scientists, postdocs and students in Condensed Matter Physics, Spectroscopy, Materials Science, Engineering, and Computer Science, to operate, maintain, and further develop advanced growth reactors and spectroscopic characterization tools within AMEL;

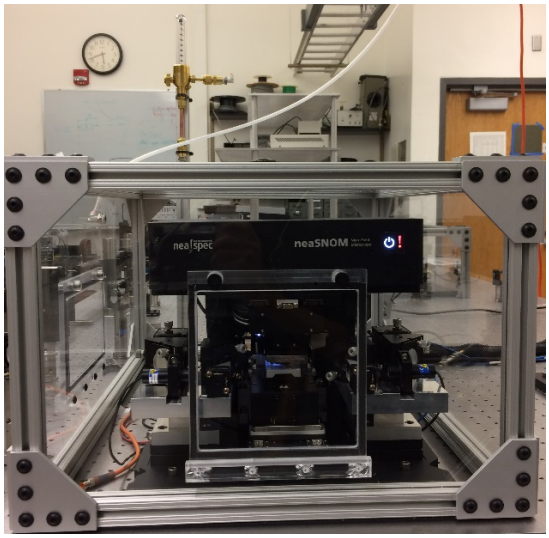
d) Services to industry and other research groups with respect to growing material/device structures, and to provide structural and optoelectronic analysis services for material structures provided.



Condensed Matter Facilities: Nano-Optics Laboratory

Dr. Abate's nano-optics laboratory is focused on light and matter interaction research at subwavelength scale. The lab is well equipped with cutting-edge research facilities that include scattering type scanning near-field microscope, Terahertz time domain spectroscope, nano-FTIR system, atomic force microscope, and capability to perform spectroscopy in a wide variety of materials and biological samples covering the spectral range of visible to terahertz at 10-15 nm spatial resolution.





The main part of our group's goal is to train postdocs, graduate and undergraduate students in the field of experimental nano-optics, theoretical foundation of nanoscale physics, problem solving skills, and data analysis. The work is funded by Research Corporation for Science Advancement, National Science Foundation, US Army Research Office and The Air Force Office of Scientific Research.

Condensed Matter Facilities: Nanoscale, Low Temperature, & High Magnetic Field Lab

The Nanoscale, Low Temperature, and High Magnetic Field Laboratory utilized by Dr. Ramesh Mani and his group is dedicated to (a) the cryogenic transport study of microwave-photoexcited- and dark systems from low to high magnetic fields, (b) the nanoscale imaging of low dimensional systems, and (c) sample fabrication using semiconductor lithography.

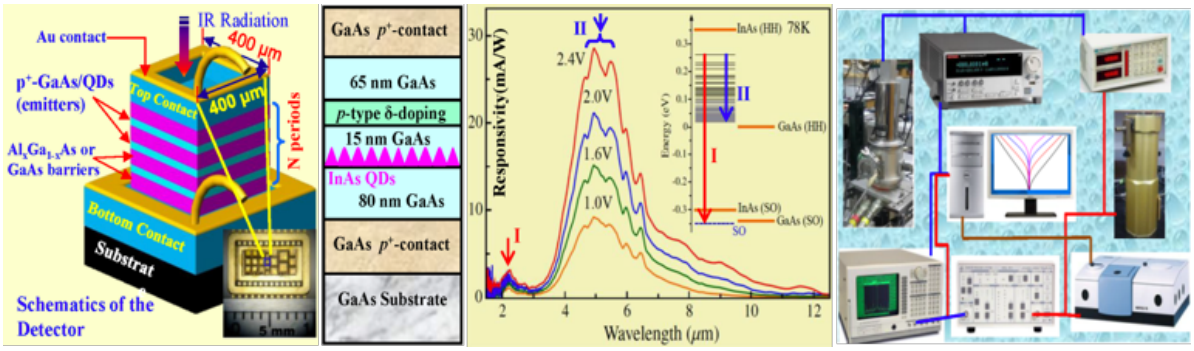
The transport laboratory includes a liquid nitrogen shielded low-loss liquid helium cryostat with a 14/16 Tesla superconducting magnet, with exchangeable inserts that allow access to different temperature regimes. Available inserts at the present include a 1.5 K - 300 K variable temperature insert, a 20 mK base temperature dilution refrigerator with "sample in liquid" and microwave access to 725 GHz for ultra-low temperature measurements, and a liquid helium-3 insert to access an intermediate temperature regime extending from 3 K down to 0.3 K. There is also a second liquid helium cryostat with a 6 Tesla magnet and a variable temperature insert for 1.5 K – 700 K operation. The specimens within the cryostats may be photo-excited with microwave radiation realized from various sources including an Agilent 83650B 0.01-50 GHz tunable output-stabilized microwave oscillator, a Gigatronics 600 6-12 GHz microwave source, a HP 695C 12-18 GHz microwave generator, and a HP 8656A 0.1-990 MHz microwave source. The Agilent 83650B 0.01-50 GHz source may be extended to the 75 -120 GHz band using an OML mm-wave module. For the characterization of the frequency and intensity of the microwave radiation, there is a 22 GHz Agilent spectrum analyzer with a supplemental external mixer to allow operation to 40 GHz in the laboratory, and various microwave power meters.

The nanoscale imaging laboratory includes a room temperature atomic resolution RHK Scanning Tunneling Microscope system with a Scanning Tunneling Microscope enclosed within a UHV 300 chamber, a PPC 100 Scanning Probe Microscope controller, IVP 200 and IVP 300 preamplifiers, and XPMPro controller software. Other nanoscale imaging equipment includes (1) a Quesant Q-Scope 250 AFM with a Quesant SPM controller, PC, and software, and (2) a Cambridge Stereoscan 360 Scanning Electron Microscope with 200kX magnification capability and a NPGS electron beam writer attachment for carrying out electron beam lithography.

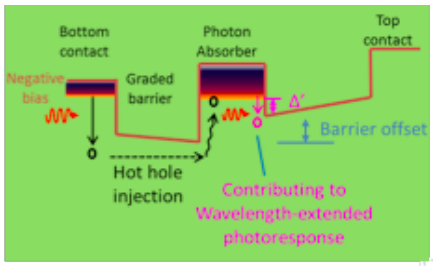
Standard electronic semiconductor characterization and measurement equipment in the laboratory includes a Wentworth probe station, three Signal Recovery 7265 lock in amplifiers, one EG&G 5209 lock in amplifier, twelve GPIB addressable 5 ½ digit DMM's, three analog low current sources, a Keithley 220 programmable current source, a nano-voltmeter, three temperature controllers, a frequency tunable waveform synthesizer, bi-polar op-amp power supplies, several oscilloscopes, and electronic manometers. Other vacuum equipment in the laboratory includes a UHV system with a three-pocket electron beam evaporator and controller, a thermal evaporator with power supply, a vacuum alloying chamber, a number of mechanical roughing pumps, diffusion pumps, five turbo pumps, a pair of sorption pumps, several diaphragm pumps, and a number of Pirani- and thermocouple gauges. The UHV systems include three ion pumps, three titanium sublimation pumps, and four complete ion-gauges.

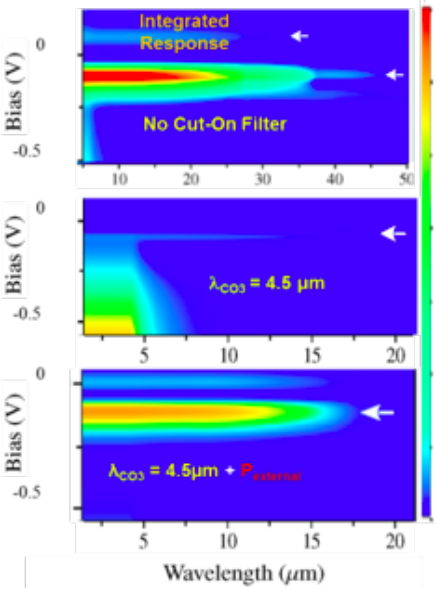
Basic optical photolithography can be carried out within the laboratory using a Quintel mask-aligner and a Headway spin coater in conjunction with a wet bench that has been set-up especially for this purpose. An oxygen plasma reactor is also available for removing photo-resist and dry-etching carbon-based systems. Electrical wire contacts can be fabricated with a Hybond thermosonic wedge/ball wire bonder. A pair of boom stand stereo zoom microscopes, and a pair of trinocular compound microscopes serve to optically inspect small specimens.

Condensed Matter Facilities: Semiconductor Optoelectronics Laboratory



The Optoelectronics Laboratory, led by Dr. Unil Perera, concentrates on device concepts, device physics, modeling, and characterization to develop novel light sensors (from ultraviolet to infrared). Various types of detectors are studied for different wavelength ranges with multiband capability, bias selectability, and polarization sensitivity. Using these detectors, we work on developing innovative applications to enhance living conditions for populations around the world.





The lab is equipped with fully computer controlled setups to measure the spectral response from 250nm to 300 μm (or 1 THz) at temperatures from 2.7K to 300K. Dark current (with ten channel multiplexer at once) down to 120 femto amps and noise current density down to 50 fA/Hz$^{1/2}$. The LCR setup measures capacitance from 0.01fF to 9.99999 F, impedance from 0.01Ω to 99.9999MΩ, inductance from 0.01nH to 99.9999KH over the frequency range of 20Hz to 1MHz with 0.05% basic accuracy, 6-digit resolution.

A minimally invasive, cost effective, rapid spectroscopic technique to detect diseases is also being explored. This could reduce the usage of costly invasive and high-risk techniques as screening tools.

Accomplishments since 2014:

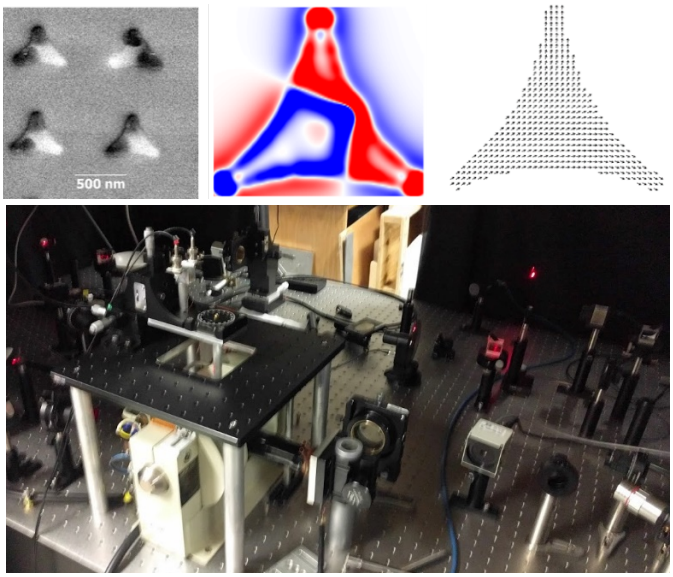
- 26 refereed journal articles
- 3 book chapters
- 13 presentations (5 invited, 1 keynote)
- 3 patents (one issued, two pending)

Collaborations include:
GSU, Leeds, Shanghai Jai Tong, Chinese Academy of Sciences - Beijing, New Mexico, Ohio State, Georgia, West Georgia, and Army Research Labs.

Condensed Matter Facilities: Spin Dynamics Laboratory

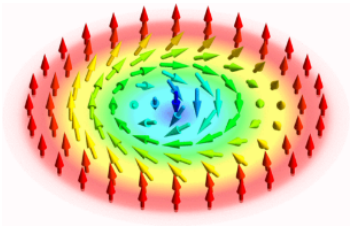
A current technology drive, directed toward future signal processing and logic devices, introduces spin degrees of freedom as an alternative complement to semiconductor charge-based electronics. Dr. Kozhanov's group explores the nano- and micro-scale properties of novel magnetic materials and assesses their use in logic and memory applications involving theoretical, numerical, and experimental techniques. There are four general research directions in the group: Nanomagnets, Spin Waves, Novel magnetic materials, and Magnetoplasmonics.

Nanomagnets are the basic building blocks for the future non-volatile memory currently being developed. The group focuses on both fundamental properties of nano-scale magnetic elements and their applied aspects. Besides information storage applications, interacting nanomagnets can be used to perform computing operations in a non-volatile manner. The facilities allow for nano-scale imaging of topology and magnetic states using Magnetic Force Microscopy and Magneto-optic Kerr effect microscopy.



Spin Waves are waves of magnetic oscillations in micro- and nano-scale magnets. Spin wave resonances in magnetic materials are used in microwave electronic devices such as delay lines, tunable filters, and attenuators. We investigate spin wave propagation phenomena and their application in nano-scale logic devices. We design, fabricate and measure spin wave structures using microwave spectroscopy techniques. We use a custom-built microwave probe station equipped with 20GHz 4 port vector network analyzer, generators, spectrum analyzers and projection field electromagnet allowing full range in-plane field rotation.

Another focus is the investigation of magnetic interactions in novel magnetic materials, in particular, ultra-thin magnetic materials with perpendicular magnetic anisotropy. Ultra-small stable magnetic vortexes called skyrmions can be formed in these materials. The skyrmion size is about 1-2 nm, which is two orders of magnitude smaller than the magnetic data bit size used in current technologies. We use magneto-optics to study fundamental magnetic interactions in ultra-thin magnetic films.



We collaborate with groups at GSU, Emory University, National Nuclear Research University, MEPhI, UCSB, and Munster University. Since 2012 we have published 10 journal articles, 1 book chapter, made 10 conference presentations, and 2 public lecture series on Spintronics.

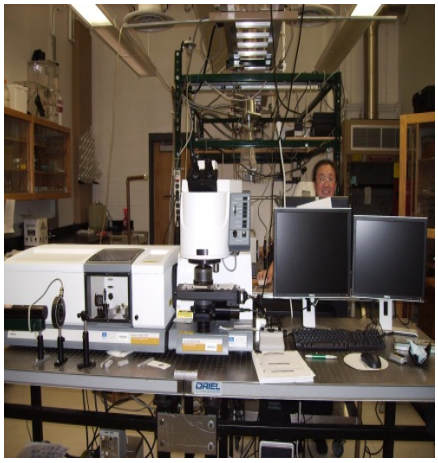
Molecular and Cellular Biophysics Facilities: Biophysical Spectroscopy Laboratories

Dr. Hastings' Research: Vibrational Spectroscopy of Biological Systems

- Time-resolved visible and infrared spectroscopy for the study of solar energy conversion processes in natural and artificial systems.
- Supercomputer based quantum chemical calculations of the properties of pigments involved in solar energy conversion processes in plants and bacteria.
- Infrared and Raman spectroscopy, microscopy and nanoscopy for the study of biological cells.
- Microalgae for biofuels, bio-products and wastewater treatment.

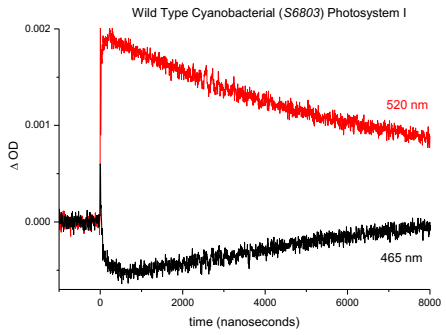
Visible Spectroscopy Lab

Wet Lab



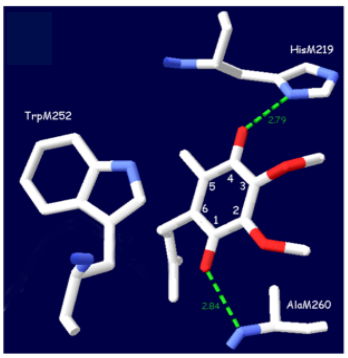
Infrared Spectroscopy Lab

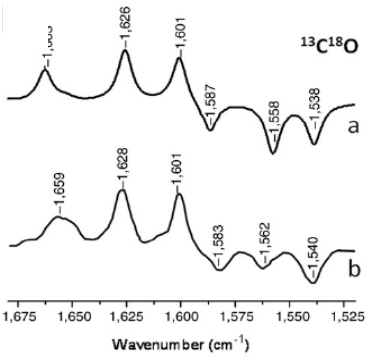
Infrared Spectroscopy
-Nanosecond time-resolved, FTIR spectrometers (x2).
-FTIR microscopic imaging system.
-Basic FTIR spectrometers.



Visible Spectroscopy
-Nanosecond time-resolved spectrometer.
-Multiple uv-vis spectrometers.

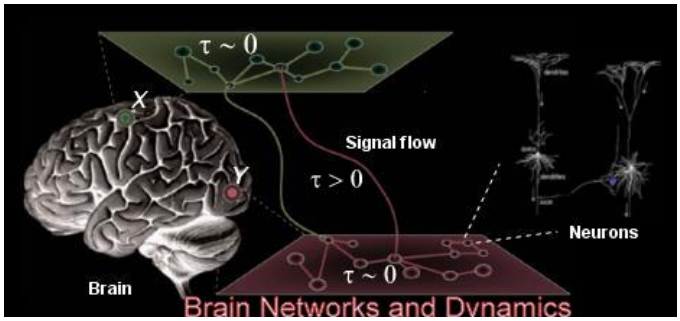
Other
-Pulsed Nd:YAG lasers (x3).
-Cryostats for low temperature work.





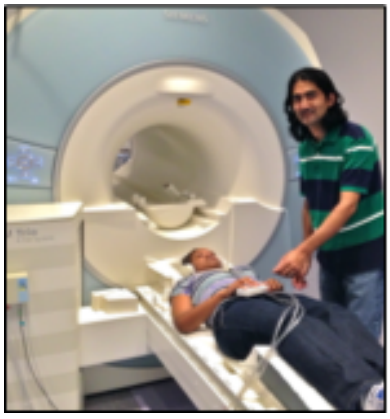
Computational Resources
Departmental and university supercomputers: GALILEO, ORION.

Neurophysics Facilities: NeuroPhysics Program at GSU



The NeuroPhysics program at GSU is dedicated to studying the physics of the brain structure and function, both in health and sickness, using neuroimaging tools and techniques.

The NeuroPhysics research group, led by Dr. Mukesh Dhamala, has a laboratory equipped with a 64-channel EEG system to record human brain electrical activity.



The NeuroPhysics program has collaborations across multiple departments at GSU and other institutions in Atlanta, and shares a 3-Tesla Magnetic Resonance Imaging scanner at the joint Georgia State and Georgia Tech Center for Advanced Brain Imaging (CABI), which is dedicated for research into the human brain.

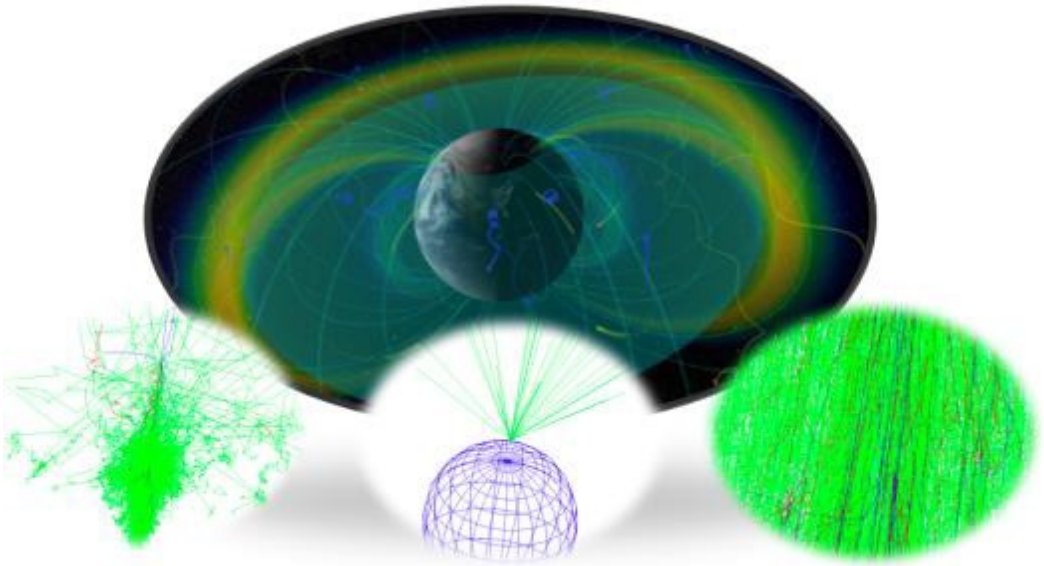
NeuroPhysics research and the functional neuroimaging course (Phys 6710/4710, or Neuro 6330) together train graduate and undergraduate students from many departments of several institutions in Atlanta including Georgia State University, Georgia Tech, and Emory University. Between 2010 and 2016, about 80 students were trained in neuroimaging studies through this course. The current NeuroPhysics research projects include several experimental and theoretical studies into human decision-making, creativity, epilepsy and stroke, development of new brain network analysis methods, and modeling of brain processes.

Nuclear Physics Facilities: Cosmic Ray / Nuclear Physics Laboratory

The GSU Nuclear Physics Group is leading on a project for developing novel and portable cosmic ray muon telescopes for measuring cosmic ray muon flux variations on a global scale and exploring the associated applications including cosmic ray muon tomography, space and earth weather monitoring, etc. The project requires developing and constructing detectors, assembling and testing electronics, and computer simulations with a large number of student participants.

The long-term goal of this project is to install many detectors in every continent around the world and to record continuously the cosmic ray flux variations in decades to come.

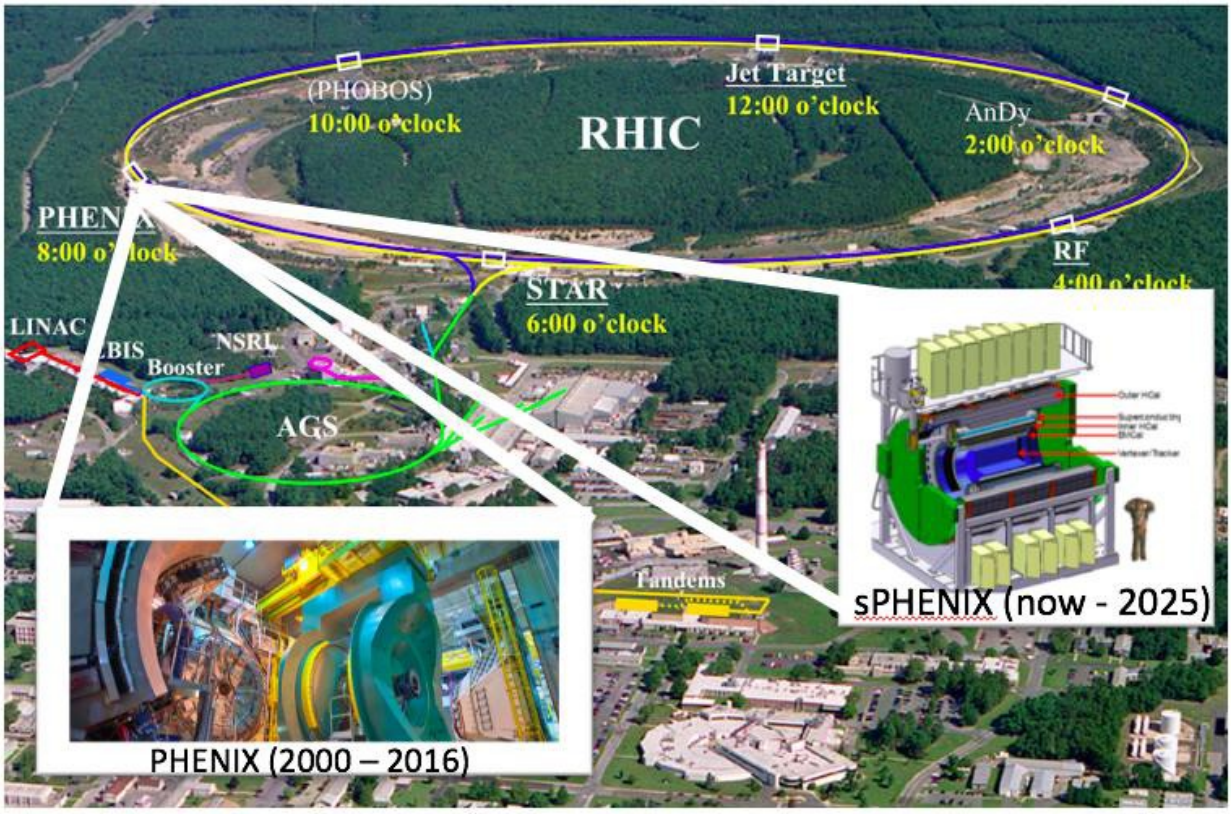
Detector Development in the Nuclear Physics Lab at GSU



Cosmic ray flux measurement at global scale and the associated applications

Nuclear Physics Facilities: Relativistic Heavy Ion Collider

RHIC is located at the Brookhaven National Laboratory in Upton, NY, and the facility collides a variety of particles at energies of 7 to 510 GeV. The primary mission of RHIC is to study nuclear matter and its interactions. In heavy ion collisions, it produces a new state of nuclear matter, a "perfect" liquid of quarks and gluons, the subatomic particles normally bound within protons and neutrons. GSU faculty and students have been active members of the PHENIX collaboration taking shifts and analyzing data. PHENIX was one of two large experiments at RHIC, collecting data from 2000 to 2016. Currently, PHENIX is undergoing a major upgrade to become sPHENIX. In the 2015 Long Range Plan of Nuclear Science, sPHENIX was described as "essential" for achieving the scientific mission of RHIC, which is included in the leading recommendation of the document. The nuclear physics group at GSU is playing a leading role in the development of the hadronic calorimeter, the largest subsystem of sPHENIX. In addition to the ongoing R&D work at GSU, GSU has hosted several important HCal workshops and the sPHENIX collaboration meeting in December 2016. RHIC plays a crucial role in training the next generation of nuclear physicists and provides GSU students with opportunities to learn hardware, electronics, and programming skills.



Aerial view of the RHIC accelerator complex. Also shown are the two generations of the large-scale heavy ion experiment at Brookhaven National Lab, Upton, New York: PHENIX (2000 – 2016) and sPHENIX (now to beyond 2025).

Physics and Astronomy High Performance Computing

The Physics and Astronomy Department has a growing cluster of small-scale High Performance Computers (HPCs) available for research use by faculty, staff, graduate students, and undergraduate students. It consists of four nodes. In addition, we have a two-node VMware cluster, which allows virtualized environments to be setup quickly for specific tasks requiring different operating systems and software for short periods.

We use CentOS 7 as our operating system, which offers both flexibility, and continuity with our current AstroNet Linux environment. Having such a system under the departmental control gives us the ability to adapt to user needs by installing software packages and updating libraries quickly.

Having this resource gives us several advantages. Users can develop and test multithreaded software on a small-scale environment, and then move to more powerful national supercomputing systems. Users can also run multiple instances of single thread code, thereby decreasing the time needed to run grids of models.

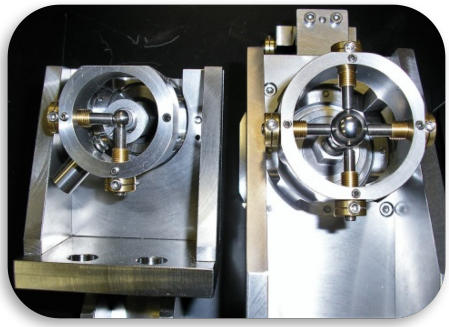
Technical Specifications

The current cluster consists of:

1. Dell R720xd with 384 GB RAM, 2 Intel Xeon E5-2680v2 CPU (40 threads) and 8TB of disk space.
2. Dell R930 with 512 GB RAM, 4 Intel Xeon E7-8880 processors (176 threads) and 8TB of disk space.
3. Dell R730 with 512GB RAM, 2 Intel Xeon E5-2698 CPU (80 threads), 24TB HDD storage, 2 Tesla K80 GPU (4,900+ CUDA processors).
4. Dell R730 with 512GB RAM, 2 Intel Xeon E5-2698 CPU (80 threads), 24TB HDD storage.

Physics and Astronomy Instrument Shop

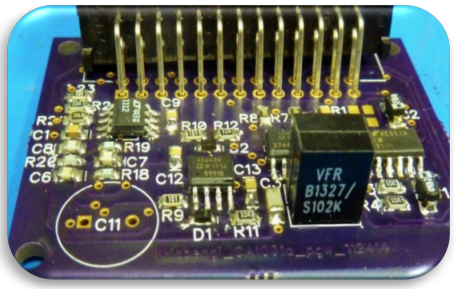
GSU's Physics & Astronomy Instrument Shop is a design, fabrication, repair and consultation facility located in the darkest corner of the Natural Science Center. Together, our three employees have many decades of experience with a wide range of scientific instrumentation.



We are a core facility serving the Department of Physics and Astronomy, GSU's Center for Nano Optics, the Center for High Angular Resolution Astronomy (CHARA), as well as the full College of Arts & Sciences. The Shop has been supporting the applied sciences at GSU for well over 50 years.

The Instrument Shop is home to three CNC machines and several manual lathes and mills, cutting tools, grinders, and presses. We work in a fairly wide variety of materials including, but certainly not limited to, stainless steel, mild steel, aluminum and acrylic. We also do glass cutting, repair, and polishing but, unfortunately, lack the facilities and expertise for glass blowing.

The Shop also has extensive electronics capabilities. Beyond diagnostics and repair, we occasionally do complete instrument designs: from concept to prototype to printed circuit to enclosure fabrication.



Beyond faculty support, we take great pride in assisting under-graduate and graduate students in shaping and realizing their own designs. Any student with a research goal is more than welcome to drop in at any time to discuss design possibilities, implementation issues or anything else. We also actively support projects of the Society of Physics Students and the Physics Graduate Student Association and provide students with one-on-one tutoring in CAD drawing on request.

Physics Education Research Enhanced Classrooms

500 CS: This room is designed for integrated lecture and laboratory courses in introductory physics. It has 6 tables of 9 students (capacity of 54) working in groups of 3 in a collaborative, student-centered teaching style. The room is equipped with white board space for each group and two projectors for the instructor to use. Dr. Robert Beichner of North Carolina State University, the creator of SCALE-UP (Student Centered Active Learning Environment for Undergraduate Physics) guided our design of the classroom.

222 NSC: This introductory physics laboratory room has 8 stations with a group of 3 students at each. This room is constructed to support collaborative, active learning as groups work on conceptual activities such as tutorials followed by inquiry-based experiments. Each station has a computer and monitor mounted on the wall to keep the working surface clear. The instructor station can be used to demonstrate an experiment or communicate information by pushing content to the second monitor at each station. Whiteboard space is available for each station and for the instructor.

E1 Selection of Peer and Aspirational Institutions

We developed the potential set of peer programs by combining the following four lists: 1) the USG Regents set of "peer" institutions [15]; 2) the USG Regents set of "aspirational peer" institutions [6]; 3) the "Great Cities' Universities" group [19 urban universities that includes GSU]; 4) institutions that offer a PhD in astronomy in a physics and astronomy department as listed in the American Institute of Physics "Roster of Astronomy Departments with Enrollment and Degree Data, 2015" [7]. We subsequently investigated the size and composition of the Physics and Astronomy (or Physics) departments at some 50 institutions using data from the individual department websites.

We applied the following criteria to winnow this very large list: 1) the department had to offer an independent PhD in Physics; 2) there had to be no separate astronomy department at that University, as we would then have to somehow combine information from both departments; 3) given the composition of our department, there had to be a significant group (at least five members) doing astronomy in the joint department; 4) given the modest size of our department, we felt it unfair to consider departments with more than 50 tenure track faculty (essentially double our size); 5) the peer university had to be part of a state system. The list satisfying all these constraints consisted of nine departments that are summarized in Appendix E2. Note that these generally have a larger number of TT faculty (28 to 36) compared to GSU (25), with the sole exception of the Department of Physics at the University of Wisconsin – Milwaukee (21).

This list of places from which information was requested is: (peers) the Universities of Alabama (Tuscaloosa), Delaware, Kentucky, New Mexico, Oregon, and Wisconsin (Milwaukee); (aspirational peers) California (Riverside), Iowa, and Pittsburgh. The selections of our aspirational peers are not the same as those in the USG Regents' list, but these three all have significantly larger numbers of faculty and higher levels of external grant support compared to the GSU Department of Physics and Astronomy. We received useful information from these institutions, and this is presented in Appendix E2.

E2 Comparison with Peer and Aspirational Peer Institutions

During September to October, 2017, we contacted a number of peer departments described in Appendix E1 in order to obtain information about their programs. We asked for data corresponding to academic year 2015-2016 that we had originally gathered from the American Institute of Physics *Roster of Physics Departments 2015*. The collected data are given in the following two tables where the second lists the numerical values per TT faculty member per year. The table begins with nine peer schools (aspirational peer schools given in bold face in the first row), then the median value, followed by the value for the GSU Department of Physics and Astronomy. The rows of the table list:

- Number of BS degrees awarded per year.
- Number of MS degrees awarded per year.
- Number of PhD degrees awarded per year.
- Number of physics majors in BS program.
- Number of graduate students in program.
- Average graduate student salary per year.
- Number of tenured and tenure-track faculty.
- Number of non-tenure track and research faculty.
- Number of postdoctoral associates.
- Annual research expenditures (in thousands of dollars).
- Number of active external grants.
- Current (not 2015-2016) indirect cost rate.
- Dollar amount of annual funding for the department from the state (sometimes ambiguous).
- Number of unique refereed publications by scholars (faculty, students, staff) associated with the department.
- Number of credit hours generated for enrolled first and second year undergraduate students.
- Number of credit hours generated for enrolled third and fourth year undergraduate students.
- Number of credit hours generated for enrolled graduate students.
- Total number of credit hours generated.

Data Collected from Peers

Item	AL-Tuscaloosa	**CA-Riverside**	Delaware	**Iowa**	Kentucky	New Mexico	Oregon	**Pittsburgh**	WI-Milwaukee	Median	GSU
Degrees											
Awarded											
BS	22	16	12	23	9	9	19	18	6	16	17
MS	9	2	3	3	3	9	11	10	3	3	7
PhD	7	15	12	12	9	9	6	14	8	9	10
Enrollment											
BS	121	50	86	96	57	130	212	89	45	89	190
Graduate	50	121	80	63	72	125	94	98	43	80	76
TA Salary	$24,996	$19,280	$26,500	$19,650	$20,000	$16,000	$17,846	$25,695	$26,000	$20,000	$20,000
No. Faculty											
Tenure (track)	29	35	30	30	28	29	29	36	21	29	25
NonTT,Research	3	14	3	0	0	19	2	6	13	3	5
PostDoc	11	14	12	10	9	7	12	26	16	12	14
Research											
Expenditures	$5,670K	$10,366K	$5,310K	$14,285K	$3,820K	$4,775K	$5,102K	$8,918K	$5,879K	$5,670K	$6,708K
Active Grants	55	59	68	165	28	67	90	95	31	67	55
Indirect Cost	49%	54%	56%	53%	53%	52%	48%	54%	52%	53%	52%
State Budget	$0K	$4,622K	$0K	$7,311K	$4,836K	$4,167K	$6,600K	$548K	$427K	$4,729K	$5,495K
Refereed Publ.	316		209		101		256	539		256	132
Teaching CH											
Lower level	17808	2132	12103	6824	16810	15427	19923	18783	10535	15427	15782
Upper level	606	2560	880	411	343	1156	1990	667	519	667	953
Graduate	663	4933	1057	224	953	1969	3326	730	276	953	5001
Total	19077	9625	14040	7459	18106	18552	25239	25239	11330	18106	21736

Peer Data Per Number of TT Faculty Per Year

Item	AL-Tuscaloosa	**CA-Riverside**	Delaware	**Iowa**	Kentucky	NewMexico	Oregon	**Pittsburgh**	WI-Milwaukee	Median	GSU
Degrees											
Awarded											
BS	0.76	0.46	0.40	0.77	0.32	0.31	0.66	0.50	0.29	0.46	0.68
MS	0.31	0.06	0.10	0.10	0.11	0.31	0.38	0.28	0.14	0.14	0.28
PhD	0.24	0.43	0.40	0.40	0.32	0.31	0.21	0.39	0.38	0.38	0.40
Enrollment											
BS	4.17	1.43	2.87	3.20	2.04	4.48	7.31	2.47	2.14	2.87	7.60
Graduate	1.72	3.46	2.67	2.10	2.57	4.31	3.24	2.72	2.05	2.67	3.04
Research											
Expenditures	$196K	$296K	$177K	$476K	$136K	$165K	$176K	$248K	$280K	$196K	$268K
Active Grants	1.90	1.69	2.27	5.50	1.00	2.31	3.10	2.64	1.48	2.27	2.20
State Budget		$132K		$244K	$173K	$144K	$228K	$15K	$20K	$144K	$220K
Refereed Publ.	10.90		6.97		3.61		8.83	14.97		8.83	5.28
Teaching CH											
Lower level	614.1	60.9	403.4	227.5	600.4	532.0	687.0	521.8	501.7	521.8	631.3
Upper level	20.9	73.1	29.3	13.7	12.3	39.9	68.6	18.5	24.7	24.7	38.1
Graduate	22.9	140.9	35.2	7.5	34.0	67.9	114.7	20.3	13.1	34.0	200.0
Total	657.8	275.0	468.0	248.6	646.6	639.7	870.3	560.6	539.5	560.6	869.4

E3 P&A Organization and Committees

Leadership Positions

Chair: D. Michael Crenshaw
Associate Chair: Brian Thoms
Astronomy Graduate Director: Sébastien Lépine
Physics Graduate Director: Xiaochun He
Astronomy Undergraduate Advisor: Ben McGimsey
Physics Undergraduate Advisor: Brian Thoms

Committees

Colloquium:
1. Dhamala
2. Connors
3. Kuzio
4. White (Chair)
5. McGimsey
6. Von Korff

Computing:
1. Baron (Chair)
2. He
3. Dietz
4. Dhamala
5. Apalkov

Curriculum:
1. Thoms
2. Evans
3. Dhamala
4. Sarsour
5. Doluweera
6. Wang
7. Wilson
8. Lépine (Chair)
9. Baron
10. Jefferies

Executive:
1. He
2. Lépine
3. Perera
4. Bentz
5. Doluweera

Library:
1. Manson (Chair)
2. Dietz
3. Sarsour
4. McGimsey
5. Gies

Publicity/Outreach:
1. Dhamala (Chair)
2. Bentz
3. Sarsour
4. Mani
5. Manson
6. Von Korff
7. Baron

Shop:
1. Dietz (Chair)
2. Mani
3. Perera
4. McAlister
5. Jefferies

E4 Faculty Roster and Hiring History

Fall 2017 Faculty Roster (2.a.1)

Name	Academic Position	Area	Department Role
Vadym Apalkov	Professor	Physics	
Fabien Baron	Assistant Professor	Astronomy	
Misty Bentz	Associate Professor	Astronomy	
Megan Connors	Assistant Professor	Physics	
D. Michael Crenshaw	Distinguished University Professor	Astronomy	Chair
Mukesh Dhamala	Associate Professor	Physics	
Nikolaus Dietz	Professor	Physics	
Sumith Doluweera	Senior Lecturer	Physics	
John Evans	Senior Lecturer	Physics	
Douglas R. Gies	Regents' Professor	Astronomy	
Gary Hastings	Professor	Physics	
Xiaochun He	Distinguished University Professor	Physics	Physics Grad. Director
Todd J. Henry	Distinguished University Professor	Astronomy	
Stuart Jefferies	Professor	Astronomy	
Alexander Kozhanov	Assistant Professor	Physics	
Rachel Kuzio de Naray	Assistant Professor	Astronomy	
Sébastien Lépine	Associate Professor	Astronomy	Astron. Grad. Director
Ramesh Mani	Professor	Physics	
Steven T. Manson	Regents' Professor	Physics	
Petrus Martens	Professor	Astronomy	
Jeremy Maune	Lecturer	Physics	
Ben Q. McGimsey	Lecturer	Astronomy	Astron. Undergraduate Advisor
Unil Perera	Regents' Professor	Physics	
Jane Pratt	Assistant Professor	Astronomy	
Murad Sarsour	Associate Professor	Physics	
Mark Stockman	Distinguished University Professor	Physics	
Brian D. Thoms	Associate Professor	Physics	Associate Chair, Physics Undergraduate Advisor
Joshua Von Korff	Assistant Professor	Physics	
Ruili Wang	Lecturer	Physics	
Russel White	Associate Professor	Astronomy	
John Wilson	Senior Acad. Professional	Astronomy	

Faculty Hiring History (2.a.1)

Fall of:	Phys TT	Astr TT	Total TT	NTT	Total	Comments
1964	2	0	2	0	2	+Hadley
1965	4	0	4	0	4	+Petit, +Hankla
1966	5	0	5	0	5	+Meder
1967	5	0	5	0	5	
1968	7	0	7	0	7	+Nave, +Manson
1969	7	0	7	0	7	+Hsu, -Jenkins
1970	9	1	10	0	10	+Purcell, +Mallard, +Miller
1971	9	1	10	0	10	
1972	9	1	10	0	10	
1973	9	2	11	0	11	+Wingert
1974	10	2	12	0	12	+Nelson
1975	10	2	12	0	12	
1976	10	2	12	0	12	
1977	10	3	13	0	13	+McAlister
1978	10	3	13	0	13	
1979	10	3	13	0	13	
1980	10	3	13	0	13	
1981	10	3	13	0	13	
1982	10	4	14	0	14	+Furenlid
1983	10	4	14	0	14	
1984	10	4	14	0	14	
1985	10	4	14	0	14	
1986	10	5	15	0	15	+Wiita
1987	10	5	15	0	15	
1988	10	6	16	0	16	+Gies
1989	10	6	16	0	16	
1990	10	6	16	0	16	
1991	10	6	16	0	16	
1992	11	6	17	0	17	+Perera
1993	12	6	18	0	18	+Xiang
1994	10	5	15	0	15	-Xiang, -Hadley, -Furenlid
1995	10	6	16	0	16	-Mallard, +Shure, +Thoms
1996	8	8	16	0	16	-Hankla, -Meder, -Petit, +Bagnuolo, +Hartkopf, +Stockman

1997	9	8	17	0	17	+Hastings
1998	9	8	17	0	17	-Purcell, +He
1999	10	8	18	0	18	+Ershov
2000	10	7	17	0	17	-Hartkopf, -Shure, -Hsu, +Henry, +Dietz
2001	9	8	17	0	17	-Ershov, +Crenshaw
2002	9	8	17	0	17	
2003	10	8	18	0	18	+Cymbaluk
2004	11	8	19	1	20	+Apalkov, +Matsik
2005	10	8	18	1	19	-Nave
2006	11	8	19	1	20	+Mani
2007	12	8	20	1	21	+Dhamala
2008	14	9	23	2	25	+Morrow,+Sarsour, +White, +Evans
2009	14	8	22	2	24	+Doluweera, -Wingert, -Matsik
2010	12	7	19	4	23	-Nelson, -Wiita, -Bagnuolo, -Cymbalyuk, +Bentz, +Zhou, +Wilson
2011	12	6	18	4	22	-McAlister
2012	13	5	18	5	23	-Miller, -Morrow, +VonKorff, +Kozhanov, +McGimsey, +Wang, -Zhou
2013	13	8	21	5	26	+Kuzio de Naray, +Baron, +Lepine
2014	15	9	24	5	29	+Briggs, +Abate, +Martens
2015	15	9	24	5	29	-Briggs, +Connors
2016	15	10	25	5	30	+Jefferies
2017	15	11	25	6	31	+Pratt, +Maune, -Abate

P&A Faculty Demographics by Gender and Race (2.a.1)

Work Status	Total	Female	Male	Black	White	Am Ind Alaskan	Pacific Isld	Asian	Multi Racial
Academic Professional (AP)	1	0	1	0	1	0	0	0	0
Adjunct Faculty (AJ)	2	1	1	0	1	0	0	1	0
Full-time (FT)	30	5	25	0	25	0	0	5	0
Part-time (PT)	4	1	3	0	4	0	0	0	0
Total:	37	7	30	0	31	0	0	6	0

Joint Faculty, Emeritus Faculty, Adjunct Faculty: please consult on-line list at www.phy-astr.gsu.edu

E5 Faculty involvement in preparation of the Self-Study

Once the requirement for the 2017-2018 round of Academic Program Review (APR) was conveyed to the Department of Physics & Astronomy (P&A), the chair of the department called a general faculty meeting and appointed a faculty member (Gies) as the chair of the self-study committee. The nominated chair, in consultation with the Office of Institutional Research, arranged for the questionnaires to be sent to faculty, students and alumni. All faculty members were given the opportunity to suggest additional questions and several were very helpful in tracking addresses of alumni. The P&A chair, in consultation with the self-study chair and the executive committee of the department, identified eight additional faculty to be the members of the self-study committee; it consists of five physicists and four astronomers, and its members represent most of the research groups in the department.

Portions of the departmental faculty meetings in the Spring 2017 semester were devoted to discussing the Academic Program Review process. Suggestions for names of external reviewers were solicited from the entire faculty. The self-study committee finalized the list of names of possible external reviewers and submitted them to the Dean through the P&A chair. The self-study committee discussed possible "peer" and "aspirational peer" departments to contact for comparative data, and the committee chair subsequently contacted the department heads of these peer departments to obtain the data presented in Appendix E2.

In the Fall 2017 semester, the nine-member committee, with the department chair as an observer, identified individual members of the self-study committee who became responsible for drafting each of the sections of the GSU self-study report and for compiling the appendices. The drafted sections were circulated among the committee members and after a meeting to discuss the drafts, updated drafts were produced. These were circulated to the entire faculty, allowing them to digest and comment on this second draft. At a general faculty meeting, held on 26 October 2017, these suggestions and additional comments were discussed and modifications were suggested. The committee then produced an updated version of the document that was again circulated among the full faculty, so as to allow for a final set of revisions to be made. The faculty voted on 30 November 2017 to approve the self-study report that was then submitted to the department chairman.

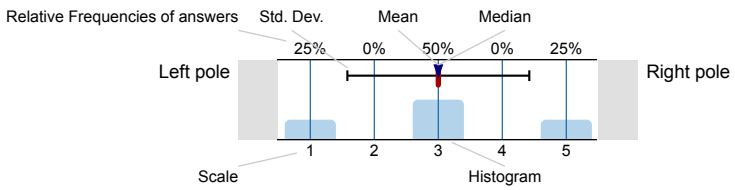
College of Arts and Sciences

Department of Physics & Astronomy Undergraduate Student Survey
No. of responses = 45
Response rate = 26%

Survey Results

Legend

Question text

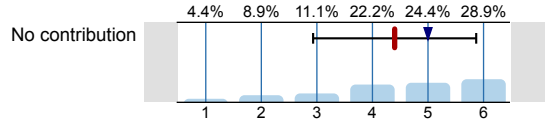


n=No. of responses
av.=Mean
md=Median
dev.=Std. Dev.
ab.=Abstention

General Learning Outcomes

To what degree is your major program of study contributing to your doing or achieving the following:

Writing clearly and effectively



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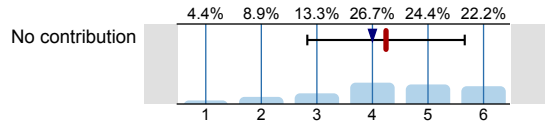
Speaking clearly and effectively



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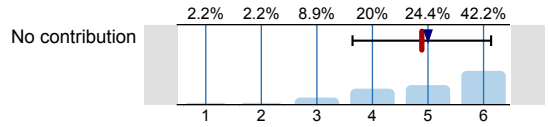
Locating and organizing information from multiple sources



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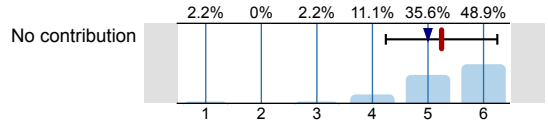
Integrating new information with past knowledge



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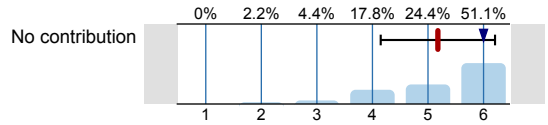
Analyzing problems from various points of view



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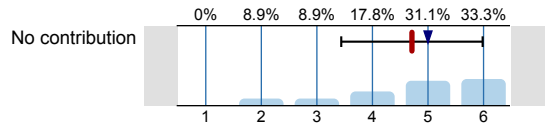
Developing original ideas



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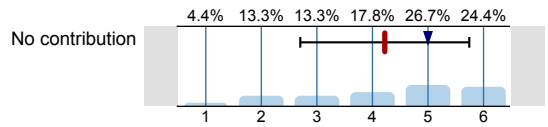
dev.=1.27

Understanding ethical standards

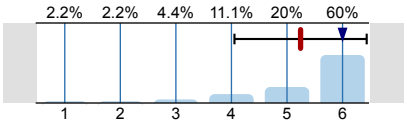


n=45
av.=4.22
md=5
dev.=1.52

Program Preparation/Challenge

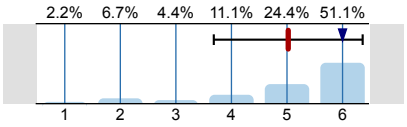
Please indicate the extent to which you agree with the following statements:

My program of study is preparing me for my career or future educational goals.

Strongly disagree  Strongly agree

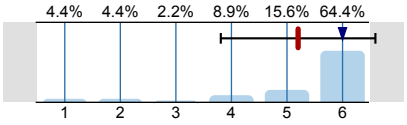
n=45
av.=5.24
md=6
dev.=1.19

My experience in the department has fostered my interest in my program of study.

Strongly disagree  Strongly agree

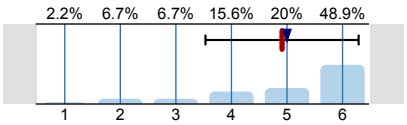
n=45
av.=5.02
md=6
dev.=1.34

My program of study is academically challenging.

Strongly disagree  Strongly agree

n=45
av.=5.2
md=6
dev.=1.39

Overall, instructors in the department stress high quality work from students.

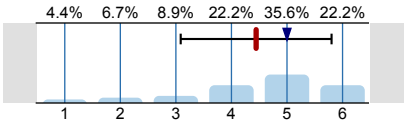
Strongly disagree  Strongly agree

n=45
av.=4.91
md=5
dev.=1.38

Program Quality

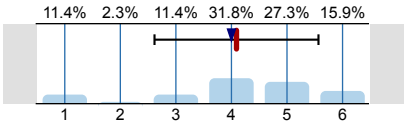
Please rate the following items:

Overall quality of undergraduate courses in the department

Poor  Excellent

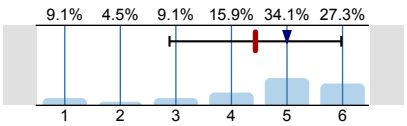
n=45
av.=4.44
md=5
dev.=1.36

Availability of undergraduate courses in the department

Poor  Excellent

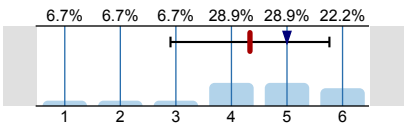
n=44
av.=4.09
md=4
dev.=1.48

Overall quality of undergraduate instruction in the department

Poor  Excellent

n=44
av.=4.43
md=5
dev.=1.55

Procedures used to evaluate student performance

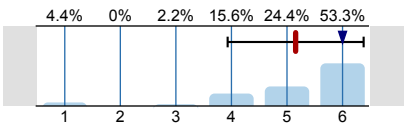
Poor  Excellent

n=45
av.=4.33
md=5
dev.=1.43

Faculty Interaction

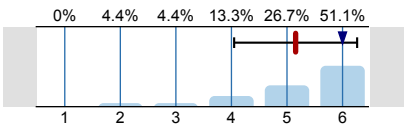
Please indicate the extent to which you agree with the following statements:

In my department, students have opportunities to do research-related activities with faculty.

Strongly disagree  Strongly agree

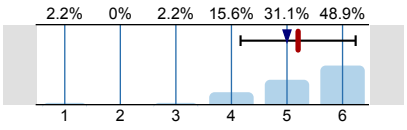
n=45
av.=5.16
md=6
dev.=1.22

In my department, faculty are available to answer questions or discuss my concerns about my program of study.

Strongly disagree  Strongly agree

n=45
av.=5.16
md=6
dev.=1.11

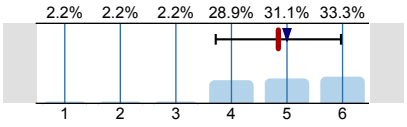
In general, faculty in my department are appropriately prepared for the courses they teach.

Strongly disagree 

Strongly agree

n=45
av.=5.2
md=5
dev.=1.04

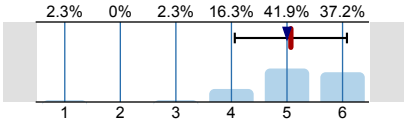
In general, faculty in the department motivate me to do my best.

Strongly disagree 

Strongly agree

n=45
av.=4.84
md=5
dev.=1.13

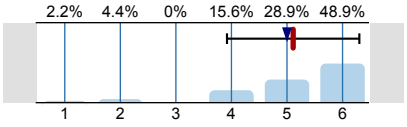
My department promotes an environment of inclusiveness and respect.

Strongly disagree 

Strongly agree

n=43
av.=5.07
md=5
dev.=1.01

I would recommend my department to other students like myself.

Strongly disagree 

Strongly agree

n=45
av.=5.11
md=5
dev.=1.19

Department of Physics and Astronomy submitted questions

I plan to continue on to a graduate degree.

Yes	75.6%	n=45
No	24.4%	

I plan to continue on to a high school teaching career.

Yes	8.9%	n=45
No	91.1%	

I am currently engaged in _____ level courses.

Freshman	27.3%	n=44
Sophomore	36.4%	
Junior	11.4%	
Senior	25%	

Profile

Academic Program Review
College of Arts and Sciences
Department of Physics & Astronomy Undergraduate Student Survey

Values used in the profile line: Mean

General Learning Outcomes

To what degree is your major program of study contributing to your doing or achieving the following:

Writing clearly and effectively	No contribution	Significant contribution	n=45	av.=4.40 md=5.00 dev.=1.47
Speaking clearly and effectively	No contribution	Significant contribution	n=45	av.=4.24 md=4.00 dev.=1.42
Locating and organizing information from multiple sources	No contribution	Significant contribution	n=45	av.=4.89 md=5.00 dev.=1.25
Integrating new information with past knowledge	No contribution	Significant contribution	n=45	av.=5.24 md=5.00 dev.=1.00
Analyzing problems from various points of view	No contribution	Significant contribution	n=45	av.=5.18 md=6.00 dev.=1.03
Developing original ideas	No contribution	Significant contribution	n=45	av.=4.71 md=5.00 dev.=1.27
Understanding ethical standards	No contribution	Significant contribution	n=45	av.=4.22 md=5.00 dev.=1.52

Program Preparation/Challenge

Please indicate the extent to which you agree with the following statements:

My program of study is preparing me for my career or future educational goals.	Strongly disagree	Strongly agree	n=45	av.=5.24 md=6.00 dev.=1.19
My experience in the department has fostered my interest in my program of study.	Strongly disagree	Strongly agree	n=45	av.=5.02 md=6.00 dev.=1.34
My program of study is academically challenging.	Strongly disagree	Strongly agree	n=45	av.=5.20 md=6.00 dev.=1.39
Overall, instructors in the department stress high quality work from students.	Strongly disagree	Strongly agree	n=45	av.=4.91 md=5.00 dev.=1.38

Program Quality

Please rate the following items:

Overall quality of undergraduate courses in the department	Poor	Excellent	n=45	av.=4.44 md=5.00 dev.=1.36
Availability of undergraduate courses in the department	Poor	Excellent	n=44	av.=4.09 md=4.00 dev.=1.48
Overall quality of undergraduate instruction in the department	Poor	Excellent	n=44	av.=4.43 md=5.00 dev.=1.55
Procedures used to evaluate student performance	Poor	Excellent	n=45	av.=4.33 md=5.00 dev.=1.43

Faculty Interaction

Please indicate the extent to which you agree with the following statements:

In my department, students have opportunities to do research-related activities with faculty.	Strongly disagree	Strongly agree	n=45	av.=5.16 md=6.00 dev.=1.22
In my department, faculty are available to answer questions or discuss my concerns about my program of study.	Strongly disagree	Strongly agree	n=45	av.=5.16 md=6.00 dev.=1.11
In general, faculty in my department are appropriately prepared for the courses they teach.	Strongly disagree	Strongly agree	n=45	av.=5.20 md=5.00 dev.=1.04
In general, faculty in the department motivate me to do my best.	Strongly disagree	Strongly agree	n=45	av.=4.84 md=5.00 dev.=1.13
My department promotes an environment of inclusiveness and respect.	Strongly disagree	Strongly agree	n=43	av.=5.07 md=5.00 dev.=1.01
I would recommend my department to other students like myself.	Strongly disagree	Strongly agree	n=45	av.=5.11 md=5.00 dev.=1.19

Comments Report

General Comments

You may use the following box to provide comments or explanations related to your responses to any of the questionnaire items.

- Availability was not available to me on the basis of my admission as a post 911 GI bill student. There is no potential for courses which do not apply directly to the completion of the degree which I have listed as my major.

  Each professor I studied under, with few exceptions, was not only highly qualified and capable, but inspired me to achieve at a high level, expected a high standard of my work, and valued my ideas. I felt that I had an excellent opportunity to reach my goals under the guidance of these professors.

- Basic physics only offered one day a week in middle of day and trashes rest of schedule so I delayed it a year.

- I believe the physic lectures cover too many materials for students in a short period of time. Professors do not teach in depth, and go over the material very quickly. Physics is a class were problem solving is extremely important but classes focus mainly on lecture than problem solving. Additionally, calculus has a recitation class but physics does not have a similar class were students can practice doing extra physics problems. Lab instructors do not seem well informed and do not respect or help the students the way they should.

- I feel like the standard of instruction in many physics courses is below the level of rigor and complexity expected at many other universities. Students are unable to answer many elementary questions in upper division courses. I recently witnessed a student in an upper division course who didn't know what radians were and yet was somehow able to satisfy the prerequisites for the course. (Many of these problems are mathematical so some of the blame in situations like this may lie with the math department as well.)

  Having said this, the faculty themselves are largely excellent in knowledge and instruction, but their expectations - and the course material - are sorely lacking to prepare students for the rigors of graduate school.

- I have not taken any physics classes yet.

- I personally believe GSU's physics department needs to enforce higher standards in their undergraduate education if the department wishes to improve. From my understanding, GSU physics students historically score poorly on the physics GRE subject test, a necessary hurdle for graduate school. Additionally, in my time studying for physics courses taken at GSU, I have come across countless sets of notes and problems from other universities which seem to be more rigorous and faster-paced than GSU.

  Improving the department would entail lectures moving more rapidly and rigorously, assigning difficult problem sets, and grading accurately.

  By more rapidly and rigorously, I mean lectures should be able to move more rapidly by teaching the material more rigorously, or more mathematically. This is in opposition to the current general trend of slowly working through concepts and then aiding this with example problems in-class. Students should be expected to accomplish practice on their own time, and additionally to read the material before class as well. Physics should be a hard major.

  Continuing along the same "rapid and rigorous" line, rapidity would allow GSU students to cover more necessary material in an undergraduate physics education. This is especially important since vital courses such as Quantum Mechanics and Classical Mechanics are only one-semester courses. At more rigorous institutions, they are each two-course minimums and so yield a full introduction to the subject. I would certainly argue for the expansion of Classical Mechanics and QM classes, and to make QM a mandatory course.

  Exams at GSU are generally based off of the homework problem sets, perhaps with only changes in numerical factors. Physics students are generally happy about this, because it means the test will be easy. This does not test any understanding of the material but of the students' ability to regurgitate problem-solving techniques. I would argue exams need to be made to truly test a students' understanding. This would, of course, lead to lower grades on average for students, and so make a GSU physics degree more valuable.

  I may be incorrect in these conclusions, and if so I will be glad, because it means I did receive a rigorous undergraduate physics education at GSU. If not, then I will be severely behind in graduate school classes. I do of course understand it is also my responsibility to learn and understand the material myself as a result of my conclusions. I have done my best to do this, however the pressure of difficult courses and harsh grading schemes is much greater of an impetus to learn the material.

- In my opinion, it seems as if the professors don't engage enough with the students. It seems as if they could care less if we pass/fail, or if we are even interested in the class AT ALL. While I understand that that's not necessarily their job, it sucks for those of us who are SERIOUSLY interested in the subjects at hand.

- Professor can't spell centripetal;Professor spends the entire class doing two questions and gets one of them wrong, meanwhile the TA and I are laughing in the back at how it is wrong. Professor is too old to care about teaching. Online tests? Easy 100 for everyone who comes to me. You think cheating doesn't happen? How naive can people be? "The questions are different, so you guys can't cheat on the tests" - Professor. TA can't explain the difference between average velocity and instantaneous velocity; Spent 20 minutes arguing with him until he finally realized he was wrong. I, an undergraduate student, would be better off explaining kinematics to other students than my TA. That may sound completely insane because the TA has much more experience in the subject than I do, but he cannot even explain average velocity and instantaneous velocity correctly. Lose the physics program gsu.....

- Teachers must be able to be understood. Availability of astronomy and other related courses is poor. Physics 1000 is a useless class that I would have liked to take but had no incentive to.

- This is my first semester at GSU, so far the department seems great, but will know better in time!

- Too long.

ACADEMIC PROGRAM REVIEW
DEPARTMENT OF PHYSICS & ASTRONOMY
UNDERGRADUATE STUDENT SURVEY COMPARISONS
SPRING 2017

Department N = 45
Department response rate = 26%

University (24 Departments) N = 2783
University response rate average = 21%

Table 1. *General Learning Outcomes*

To what degree is your major program of study contributing to your doing or achieving the following:	Dept. M	Univ. M
Writing clearly and effectively	4.40	4.69
Speaking clearly and effectively	4.24	4.55
Locating and organizing information from multiple sources	4.89	4.88
Integrating new information with past knowledge	5.24	5.07
Analyzing problems from various points of view	5.18	4.99
Developing original ideas	4.71	4.66
Understanding ethical standards	4.22	4.90

Note. Mean scale: 1=No contribution to 6=Significant contribution.

Table 2. *Program Preparation/Challenge*

Please indicate the extent to which you agree with the following statements:	Dept. M	Univ. M
My program of study is preparing me for my career or future educational goals.	5.24	4.91
My experience in the department has fostered my interest in my program of study.	5.02	4.82
My program of study is academically challenging.	5.20	5.04
Overall, instructors in the department stress high quality work from students.	4.91	5.09

Note. Mean scale: 1=Strongly disagree to 6=Strongly agree.

Table 3. *Program Quality*

Please rate the following items:	Dept. M	Univ. M
Overall quality of undergraduate courses in the department	4.44	4.70
Availability of undergraduate courses in the department	4.09	4.20
Overall quality of undergraduate instruction in the department	4.43	4.69
Procedures used to evaluate student performance	4.33	4.48

Note. Mean scale: 1=Poor to 6=Excellent.

Table 4. Faculty Interaction

Please indicate the extent to which you agree with the following statements:	Dept. M	Univ. M
In my department, students have opportunities to do research-related activities with faculty.	5.16	4.14
In my department, faculty are available to answer questions or discuss my concerns about my program of study.	5.16	4.91
In general, faculty in my department are appropriately prepared for the courses they teach.	5.20	5.02
In general, faculty in the department motivate me to do my best.	4.84	4.84
My department promotes an environment of inclusiveness and respect.	5.07	4.99
I would recommend my department to other students like myself.	5.11	4.91

Note. Mean scale: 1=Strongly disagree to 6=Strongly agree.

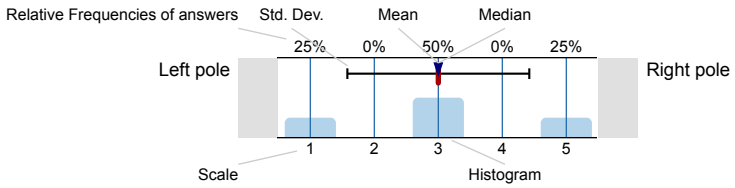
College of Arts and Sciences

Department of Physics & Astronomy - Undergraduate Alumni Survey
No. of responses = 15
Response rate = 22%

Survey Results

Legend

Question text

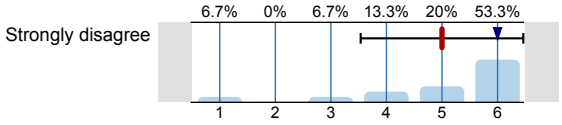


n=No. of responses
av.=Mean
md=Median
dev.=Std. Dev.
ab.=Abstention

General Outcomes

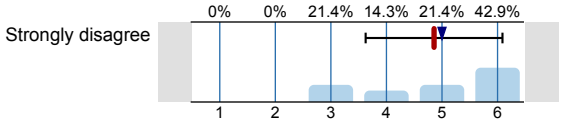
Please indicate the extent to which you agree with the following statements:

My program of study has made a positive contribution to the quality of my life.



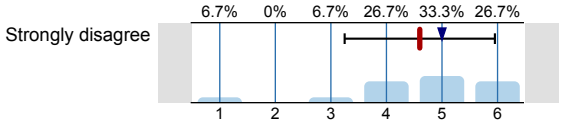
n=15
av.=5
md=6
dev.=1.46

I have applied the skills I learned in my program to help resolve issues I've faced in my professional life.



n=14
av.=4.86
md=5
dev.=1.23

Overall, I was satisfied with my degree program.



n=15
av.=4.6
md=5
dev.=1.35

Employment

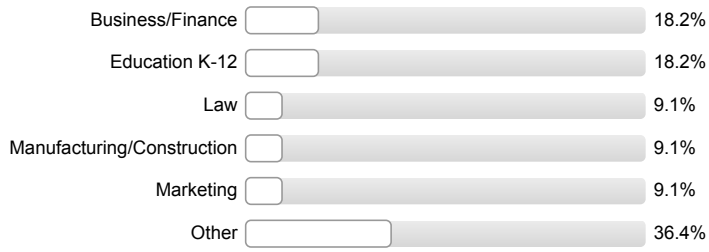
Are you currently employed?

n=15

Have you been employed at any time over the last year?

n=5

Please indicate the general area of employment.



n=11

Skills and Employment

Research skills

n=11

Communication skills (writing and speaking)

n=10

Ability to interpret data/information in a critical manner

n=11

Ability to analyze problems from different perspectives

n=11

Ability to work with diverse populations

n=11

Research skills

n=11

Communication skills (writing and speaking)

n=11

Ability to interpret data/information in a critical manner

n=11

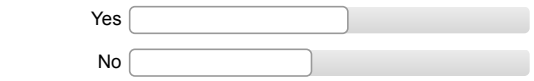
Ability to analyze problems from different perspectives

n=11

Ability to work with diverse populations

n=11

Research skills



n=11

Communication skills (writing and speaking)

n=11

Ability to interpret data/information in a critical manner

n=11

Ability to analyze problems from different perspectives

n=11

Ability to work with diverse populations

n=11

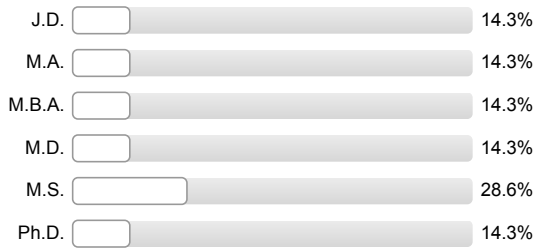
Further Education

Are you currently enrolled in a graduate program?

n=15

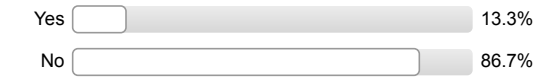
What degree are you seeking?

n=7



Since graduating from Georgia State, have you earned an additional degree(s)?

n=15



Profile

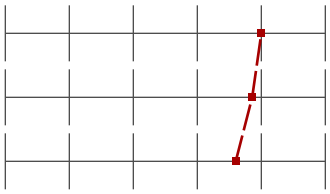
Academic Program Review
College of Arts and Sciences
Department of Physics & Astronomy - Undergraduate Alumni Survey

Values used in the profile line: Mean

General Outcomes

Please indicate the extent to which you agree with the following statements:

My program of study has made a positive contribution to the quality of my life.	Strongly disagree	Strongly agree	n=15 av.=5.00 md=6.00 dev.=1.46
I have applied the skills I learned in my program to help resolve issues I've faced in my professional life.	Strongly disagree	Strongly agree	n=14 av.=4.86 md=5.00 dev.=1.23
Overall, I was satisfied with my degree program.	Strongly disagree	Strongly agree	n=15 av.=4.60 md=5.00 dev.=1.35



Comments Report

Employment

Other:

- Engineering
- GE Aviation - CMC Lean Lab
- Retail framing
- Sales currently in law school
- Science: Working in a private lab.

Further Education

What is your program of study?

- Astronomy
- Chemistry
- Electrical and computer engineering
- MBA
- Medicine

At what institution are you pursuing your degree?

- Georgia Institute of Technology
- Georgia State University
- Stony Brook University School of Medicine
- University of Rochester
- University of Washington

Please tell us what additional degree you earned, the program of study, and the degree-granting institution.

- Advanced technical certificate in paralegal studies
- M.S. in Astronomy, University of Washington

Overall Evaluation

Looking back, what aspects of your program do you believe were the most valuable in contributing to your earning a degree at Georgia State?

- Clear expectations from professors, with syllabus's that were generally followed.

  Opportunities to redo missed problems for credit. It was invaluable to get a second chance to understand questions on tests and homework.
- Having research opportunities early in my program was the most important contributor to me applying to and being admitted to graduate school.
- I believe that the option to pursue the degree with different available options of specialization/focus combined with the broad range of elective courses proved to be most valuable.
- IT, Computer science courses.
- My individual research in a professors lab was invaluable to both my degree and making me marketable to jobs once outside of school. It allowed me to take the theoretical knowledge learned in the classroom and apply it to real problems. Doing this cemented the principles of what I had learned, and kept me interested and hungry in the pursuit of more.
- Physics program/ teachers certification
- Research
- Research skills and communication skills.
- Society of Physics Students provided a good support system.
  The professors were available and willing to help.
- Staff to student ratio, strong analytical skills, and great staff engagement.
- The guided research with seasoned researches was fantastic.
- The undergraduate advisor, Dr. Brian Thoms, was essential in designing a way for me to complete my degree in the four year time frame. He was always willing to meet and talk at length about my plans for the future (grad school, etc.) and how my schedule should be designed. Dr. Todd Henry of the astronomy department was my best advisor for everything else in my life. He really pushed me to work hard and without that pushing, I may have been able to earn the degree but I would not have been as prepared for my current educational aspirations.

What kinds of improvements would you suggest the department make in order to enhance the educational experience of current students in the program?

- A physics major involves a great deal of challenging coursework in which it is very difficult to connect the gap that exists between fundamental lecture and subsequent assignments. I believe that it should be mandatory to offer after-class tutorial sessions in which students are introduced to the sorts of reasoning skills they will need to complete problems, and this need for supplemental assistance is urgently needed in the upper-level 3000 and 4000 level courses. If this is not feasible, perhaps the department can administer practice exams with problems that are very similar to real exam problems and devote class time to going over the solutions to these problems. At times, it felt as though the difference between success and failure in the curriculum boiled down to whether or not I was able to come up with reasonable solutions to problems from scratch.
- A strong work study program that would really help place physics students.
- Focus on labs, oral problem solving, and skills for career opportunities.
- Increase focus on how to prepare students for jobs in private and public sector, improved communication skills, and business etiquette and ethics, and more programming expertise.
- Make computer programming and software development a more integral part of the curriculum. These are crucial skills for scientific research and many private sector jobs that Physics majors are likely to apply for.

  While my experience in the program was generally very positive, I have some comments about the department climate during my time there. Faculty should have kept a closer eye on the climate among the undergraduate majors, such as the SPS. Although most interactions between the undergraduates were positive and supportive, I also witnessed multiple incidents of harassment, and a more pervasive culture of microaggressions. These incidents were ultimately resolved with varying degrees of success, but the initial faculty response was inadequate. I also know that these incidents had a very detrimental impact on my peers who were the victims. The faculty should have provided better education about the student code of conduct and made it clear that harassment and microaggressions are unacceptable and will not be tolerated.
- Make the progression of class order easier to understand. When I first transferred I found myself under qualified in classes meant for seniors instead of sophomores/juniors.
- More online class options.
- More research opportunities.
- Not directed to specific professors but I would say strengthen the ability of tests to evaluate students accurately. In nearly all of the upper level (3000/4000) math/ physics classes, the averages on the tests were well below the traditional failing margin (~70/100). Because of this, professors would have to curve the tests and students could honestly get away with not studying too hard because everyone's grade in the class would be curved to extraordinary lengths. Transitioning to where I am at now, the tests are very difficult and it matters not how the other students perform, the grade you receive is the raw score and no curving ever occurs under any circumstances. If tests were designed in a way that students could reasonably score in the passing range, I feel that it would force students to try harder and improve the student body as a whole.
- Quantum mechanics should be part of the core major requirements.
- none

Department specific questions.

We currently send out a Department of Physics and Astronomy Newsletter annually, and we post news items on the GSU Physics and Astronomy Facebook page. Please offer any suggestions about how we may better stay in touch with you.

- As I have chosen to remain at Georgia State to complete another degree, I can be conveniently contacted through my panthermail address.
- Emails, conferences, GSU events related to physics and astronomy, fund raisers, etc.
- N/A
- none
- nothing to change

General Comments

You may use the following box to provide general comments or explanations related to your responses to any of the questionnaire items.

- As a physics graduate from this institution, I feel as though I have been given an accurate picture of what it means to study this field, and feel as though this program has prepared me to do what I would like with my career plans.
- I have appreciated what everyone at GSU has done to prepare me for my professional career. I am willing to do my part to give back and help better the physics and astronomy program at GSU so students may have immediate employment opportunities upon graduation.

ACADEMIC PROGRAM REVIEW
DEPARTMENT OF PHYSICS & ASTRONOMY
UNDERGRADUATE ALUMNI SURVEY COMPARISONS
SPRING 2017

Dept. N = 15
Dept. response rate = 22%

University (24 Departments) N = 1190
University response rate average = 15%

General Outcomes

Table 1.

Please indicate the extent to which you agree with the following statements:	Dept. M	Univ. M
My program of study has made a positive contribution to the quality of my life.	5.00	4.79
I have applied the skills I learned in my program to help resolve issues I've faced in my professional life.	4.86	4.56
Overall, I was satisfied with my degree program.	4.60	4.71

Note. Mean scale: 1=Strongly disagree to 6=Strongly agree.

Employment

Table 2.
Are you currently employed?

Dept.		Univ.	
N = 15	%	N= 1184	%
Yes	66.7		80.8
No	33.3		19.2

Table 3.
Have you been employed at any time over the last year?

Dept.		Univ.	
N = 5	%	N= 232	%
Yes	20.0		53.4
No	80.0		46.6

Table 4.
Please indicate the general area of employment.

	Dept.		Univ.	
	N = 11	%	N = 1067	%
Agriculture/Natural Resources		.0		.1
Arts		.0		1.4
Business/Finance		18.2		11.0
College Faculty/Administration		.0		3.6
Counseling/Mental Health		.0		1.5
Education K-12		18.2		11.3
Government/Public Administration		.0		5.4
Hospitality/Tourism		.0		5.5
Journalism/Publication		.0		.9
Law		9.1		3.9
Library Work		.0		.7
Manufacturing/Construction		9.1		.8
Marketing		9.1		3.9
Media/Communication		.0		2.5
Medicine/Nursing		.0		10.8
Non-Profit or Community Org.		.0		6.7
Religious Organization		.0		.7
Transportation		.0		1.5
Other		36.4		27.6

Table 5. *Skills and Employment* ***(Department)***

The following questions focus on the skills you may have learned in your degree program at Georgia State and whether you listed them on your resume, discussed them during your job interview, or use(used) them in your job.

Department	List on resume		Discuss in job interview		Using(used) on job	
	Yes	No	Yes	No	Yes	No
	%	%	%	%	%	%
Research skills	63.6	36.4	72.7	27.3	54.5	45.5
Communication skills (writing and speaking)	80.0	20.0	100.0	.0	100.0	.0
Ability to interpret data/information in a critical manner.	81.8	18.2	100.0	.0	100.0	.0
Ability to analyze problems from different perspectives	81.8	18.2	100.0	.0	100.0	.0
Ability to work with diverse populations	72.7	27.3	100.0	.0	90.9	9.1

Table 6. *Skills and Employment* ***(University)***

University	List on resume		Discuss in job interview		Using(used) on job	
	Yes	No	Yes	No	Yes	No
	%	%	%	%	%	%
Research skills	49.4	50.6	42.1	57.9	67.8	32.2
Communication skills (writing and speaking)	79.0	21.0	83.5	16.5	95.7	4.3
Ability to interpret data/information in a critical manner.	61.1	38.9	65.1	34.9	81.1	18.9
Ability to analyze problems from different perspectives	66.6	33.4	77.0	23.0	89.2	10.8
Ability to work with diverse populations	70.6	29.4	77.2	22.8	90.8	9.2

Further Education

Table 6.
Are you currently enrolled in a graduate program?

Dept.		Univ.	
N = 15	%	N= 1183	%
Yes	40.0		20.5
No	60.0		79.5

Table 7.
What degree are you seeking?

	Dept.		Univ.	
	N = 7	%	N = 273	%
Ed.D.		.0		1.1
J.D.		14.3		11.0
M.A.		14.3		22.7
M.B.A.		14.3		7.3
M.D.		14.3		2.2
M.Div.		.0		.7
M.F.A.		.0		1.5
M.S.		28.6		22.0
M.S.W.		.0		6.6
M.S.L.S.		.0		.7
M.T.S.		.0		.0
Ph.D.		14.3		6.6
Th.D.		.0		.0
Other		.0		17.6

Table 8.
Since graduating from Georgia State, have you earned an additional degree(s)?

Dept.		Univ.	
N = 15	%	N= 1158	%
Yes	13.3		8.5
No	86.7		91.5

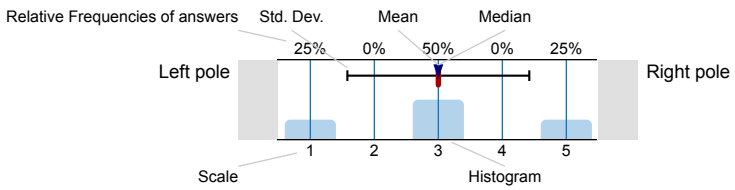
College of Arts and Sciences

Department of Physics & Astronomy Graduate Student Survey
No. of responses = 38
Response rate = 54%

Survey Results

Legend

Question text

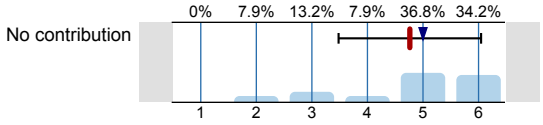


n=No. of responses
av.=Mean
md=Median
dev.=Std. Dev.
ab.=Abstention

General Learning Outcomes

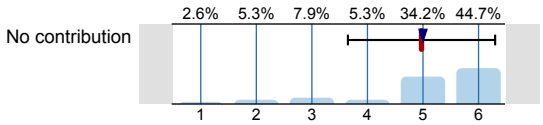
To what degree is your major program of study contributing to your doing or achieving the following:

Writing clearly and effectively



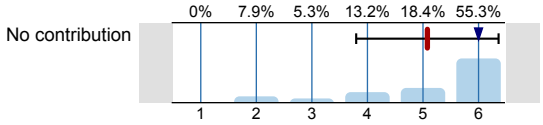
n=38
av.=4.76
md=5
dev.=1.28

Speaking clearly and effectively



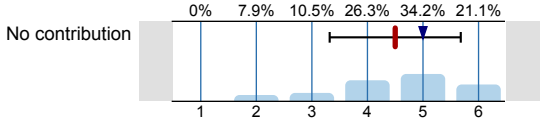
n=38
av.=4.97
md=5
dev.=1.33

Locating and organizing information from multiple sources



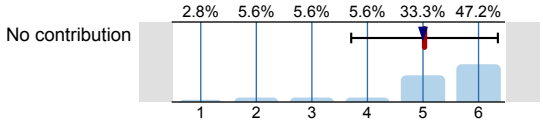
n=38
av.=5.08
md=6
dev.=1.28

Awareness of historical contexts surrounding your area of study



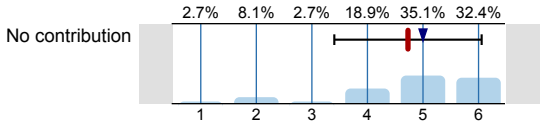
n=38
av.=4.5
md=5
dev.=1.18

Demonstrating competence in specific research methods appropriate to your area of specialization



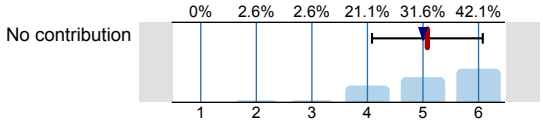
n=36
av.=5.03
md=5
dev.=1.32

Effectively evaluate implications and applications of research in your field



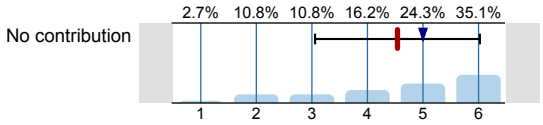
n=37
av.=4.73
md=5
dev.=1.33

Collaborating effectively with colleagues (e.g., other students, researchers, faculty)



n=38
av.=5.08
md=5
dev.=1

Knowledge about the tenets of ethical practice



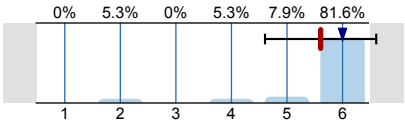
n=37
av.=4.54
md=5
dev.=1.48

Program Preparation/Challenge

Please indicate the extent to which you agree with the following statements:

My program of study is academically challenging.

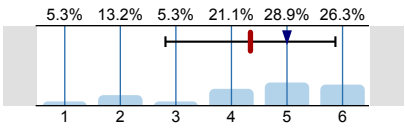
Strongly disagree — Strongly agree



n=38
av.=5.61
md=6
dev.=1

My program requirements are clear to me.

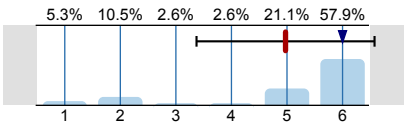
Strongly disagree — Strongly agree



n=38
av.=4.34
md=5
dev.=1.53

There are sufficient research opportunities available to me in the department.

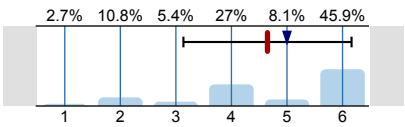
Strongly disagree — Strongly agree



n=38
av.=4.97
md=6
dev.=1.6

My program's curriculum is broad enough to prepare me for my career choice.

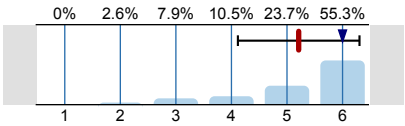
Strongly disagree — Strongly agree



n=37
av.=4.65
md=5
dev.=1.51

Overall, instructors in the department stress high quality work from students.

Strongly disagree — Strongly agree



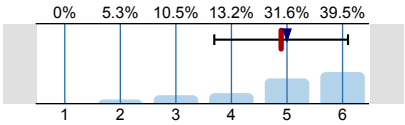
n=38
av.=5.21
md=6
dev.=1.09

Program Quality

Please rate the following items:

Overall quality of graduate courses in the department

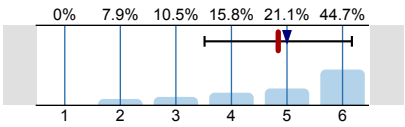
Poor — Excellent



n=38
av.=4.89
md=5
dev.=1.2

Availability of graduate courses in the department

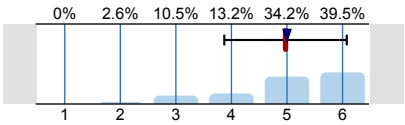
Poor — Excellent



n=38
av.=4.84
md=5
dev.=1.33

Overall quality of graduate instruction in the department

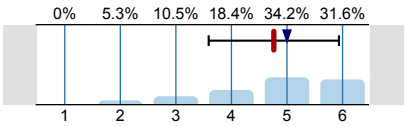
Poor — Excellent



n=38
av.=4.97
md=5
dev.=1.1

Academic advisement available in the department

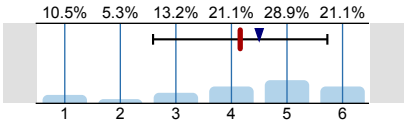
Poor — Excellent



n=38
av.=4.76
md=5
dev.=1.17

Career preparation and guidance available in the department

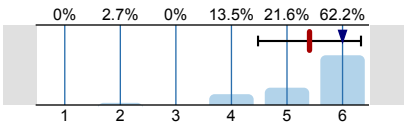
Poor — Excellent



n=38
av.=4.16
md=4.5
dev.=1.57

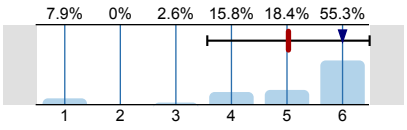
Availability of graduate research/teaching assistantships

Poor — Excellent



n=37
av.=5.41
md=6
dev.=0.93

Support for student conference presentations and publications

Poor 

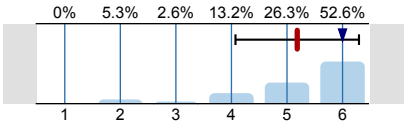
Excellent

n=38
av.=5.03
md=6
dev.=1.46

Faculty Interaction

Please indicate the extent to which you agree with the following statements:

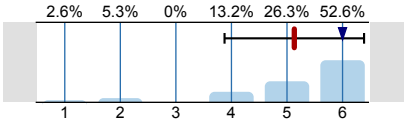
In general, faculty in my department are appropriately prepared for the courses they teach.

Strongly disagree 

Strongly agree

n=38
av.=5.18
md=6
dev.=1.11

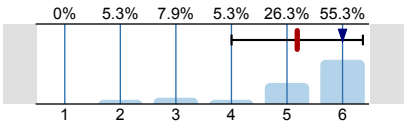
In general, faculty are up-to-date in emerging trends and information in my field of study.

Strongly disagree 

Strongly agree

n=38
av.=5.13
md=6
dev.=1.26

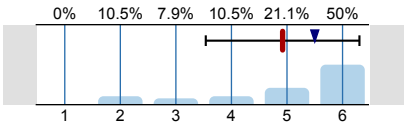
In my department, faculty are available to answer questions or discuss my concerns about my program of study.

Strongly disagree 

Strongly agree

n=38
av.=5.18
md=6
dev.=1.18

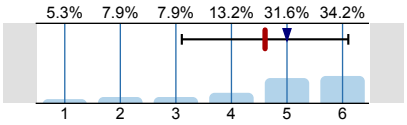
In general, faculty in the department motivate me to do my best.

Strongly disagree 

Strongly agree

n=38
av.=4.92
md=5.5
dev.=1.38

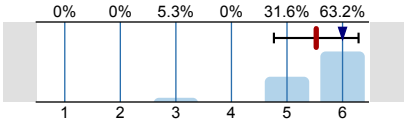
Faculty are fair and unbiased in their treatment of students in my graduate program.

Strongly disagree 

Strongly agree

n=38
av.=4.61
md=5
dev.=1.5

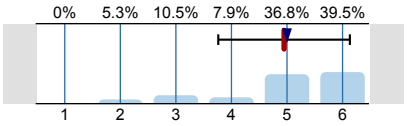
Administrative staff in the department are helpful to me.

Strongly disagree 

Strongly agree

n=38
av.=5.53
md=6
dev.=0.76

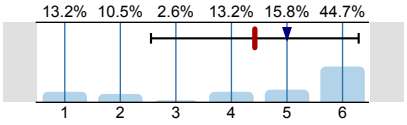
My department promotes an environment of inclusiveness and respect.

Strongly disagree 

Strongly agree

n=38
av.=4.95
md=5
dev.=1.18

I would recommend my department to other students like myself.

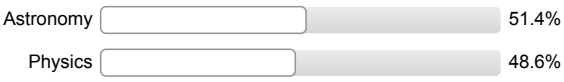
Strongly disagree 

Strongly agree

n=38
av.=4.42
md=5
dev.=1.87

Department-specific questions

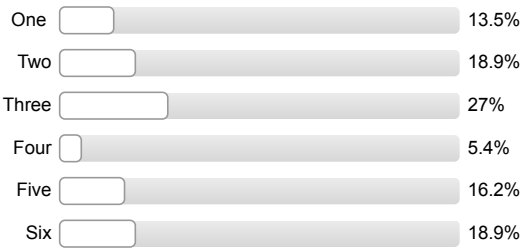
I am currently in the _____ program.



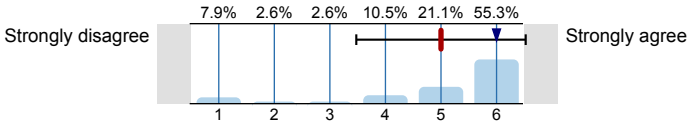
n=37

I have been enrolled in the program for _____ years.

n=37



I am satisfied with the process of finding a research supervisor/mentor.



n=38
av.=5
md=6
dev.=1.52

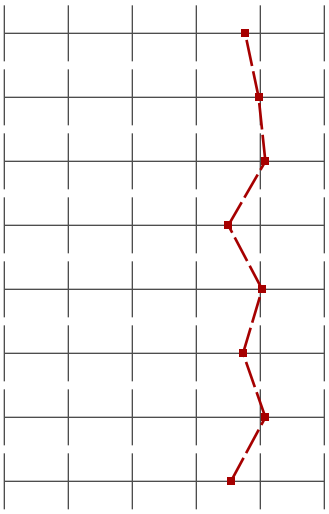
Profile

Academic Program Review
College of Arts and Sciences
Department of Physics & Astronomy Graduate Student Survey

Values used in the profile line: Mean

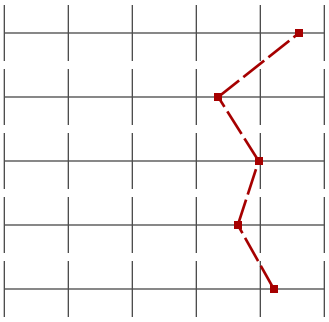
General Learning Outcomes

To what degree is your major program of study contributing to your doing or achieving the following:

Writing clearly and effectively	No contribution		Significant contribution	n=38	av.=4.76 md=5.00 dev.=1.28
Speaking clearly and effectively	No contribution		Significant contribution	n=38	av.=4.97 md=5.00 dev.=1.33
Locating and organizing information from multiple sources	No contribution		Significant contribution	n=38	av.=5.08 md=6.00 dev.=1.28
Awareness of historical contexts surrounding your area of study	No contribution		Significant contribution	n=38	av.=4.50 md=5.00 dev.=1.18
Demonstrating competence in specific research methods appropriate to your area of specialization	No contribution		Significant contribution	n=36	av.=5.03 md=5.00 dev.=1.32
Effectively evaluate implications and applications of research in your field	No contribution		Significant contribution	n=37	av.=4.73 md=5.00 dev.=1.33
Collaborating effectively with colleagues (e.g., other students, researchers, faculty)	No contribution		Significant contribution	n=38	av.=5.08 md=5.00 dev.=1.00
Knowledge about the tenets of ethical practice	No contribution		Significant contribution	n=37	av.=4.54 md=5.00 dev.=1.48

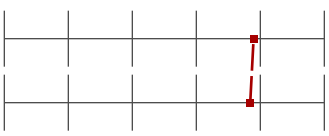
Program Preparation/Challenge

Please indicate the extent to which you agree with the following statements:

My program of study is academically challenging.	Strongly disagree		Strongly agree	n=38	av.=5.61 md=6.00 dev.=1.00
My program requirements are clear to me.	Strongly disagree		Strongly agree	n=38	av.=4.34 md=5.00 dev.=1.53
There are sufficient research opportunities available to me in the department.	Strongly disagree		Strongly agree	n=38	av.=4.97 md=6.00 dev.=1.60
My program's curriculum is broad enough to prepare me for my career choice.	Strongly disagree		Strongly agree	n=37	av.=4.65 md=5.00 dev.=1.51
Overall, instructors in the department stress high quality work from students.	Strongly disagree		Strongly agree	n=38	av.=5.21 md=6.00 dev.=1.09

Program Quality

Please rate the following items:

Overall quality of graduate courses in the department	Poor		Excellent	n=38	av.=4.89 md=5.00 dev.=1.20
Availability of graduate courses in the department	Poor		Excellent	n=38	av.=4.84 md=5.00 dev.=1.33

Overall quality of graduate instruction in the department	Poor	Excellent	n=38	av.=4.97 md=5.00 dev.=1.10
Academic advisement available in the department	Poor	Excellent	n=38	av.=4.76 md=5.00 dev.=1.17
Career preparation and guidance available in the department	Poor	Excellent	n=38	av.=4.16 md=4.50 dev.=1.57
Availability of graduate research/teaching assistantships	Poor	Excellent	n=37	av.=5.41 md=6.00 dev.=0.93
Support for student conference presentations and publications	Poor	Excellent	n=38	av.=5.03 md=6.00 dev.=1.46

Faculty Interaction

Please indicate the extent to which you agree with the following statements:

In general, faculty in my department are appropriately prepared for the courses they teach.	Strongly disagree	Strongly agree	n=38	av.=5.18 md=6.00 dev.=1.11
In general, faculty are up-to-date in emerging trends and information in my field of study.	Strongly disagree	Strongly agree	n=38	av.=5.13 md=6.00 dev.=1.26
In my department, faculty are available to answer questions or discuss my concerns about my program of study.	Strongly disagree	Strongly agree	n=38	av.=5.18 md=6.00 dev.=1.18
In general, faculty in the department motivate me to do my best.	Strongly disagree	Strongly agree	n=38	av.=4.92 md=5.50 dev.=1.38
Faculty are fair and unbiased in their treatment of students in my graduate program.	Strongly disagree	Strongly agree	n=38	av.=4.61 md=5.00 dev.=1.50
Administrative staff in the department are helpful to me.	Strongly disagree	Strongly agree	n=38	av.=5.53 md=6.00 dev.=0.76
My department promotes an environment of inclusiveness and respect.	Strongly disagree	Strongly agree	n=38	av.=4.95 md=5.00 dev.=1.18
I would recommend my department to other students like myself.	Strongly disagree	Strongly agree	n=38	av.=4.42 md=5.00 dev.=1.87

Department-specific questions

I am satisfied with the process of finding a research supervisor/mentor.	Strongly disagree	Strongly agree	n=38	av.=5.00 md=6.00 dev.=1.52

Comments Report

General Comments

You may use the following box to provide general comments or explanations related to your responses to any of the questionnaire items.

- Support for student conference presentations and publications - I think, this totally depends on the research adviser.

  I would recommend my department to other students like myself. - I think another important thing is students' stipend. Comparing with other state universities, the GSU student stipend is not enough (since GSU is located in the metro area, the living cost is high.)

- -Make qualifier exam requirements and expectations clear in a written document.
  -Grade qualifier exams without names at the top if not already being done (quantitative questions with the names removed, qualitative questions typed).

- I love this place!

- It seems that the department set so many unnecessary course requirements for MS/PhD graduation long ago and forget to review it. Please, I recommend that this department survey other similar institutions and revise the course requirements so that future students will have more time to focus on their research.

- Program requirements are unclear and seem to change often.

- Thank you for considering conducting this "important" survey. If I remember correctly, this is the first time I got an opportunity to participate in this kind of survey from my own department. So this is even more important to me personally. If somebody cares, I look forward to seeing more surveys on unethical conduct of supervisor(s) that is affecting DEFENSELESS/HELPLESS graduate student(s). Oh, I was assuming that the "unethical" or probably "illegal" things are real. I could be wrong though, or maybe it does not matter. Thanks.

- The word Faculty is too general, I should say all these answers do not apply to all the faculty members. There are exceptions always. I do not understand the purpose of this survey. This is not a useful survey; it does not address some important things, especially about payments and salaries. Cost of everything is increasing but not our salary.

- There is a distinct disparity in how students are treated and the opportunities they are given in the department. In general, the students who aim to go into academia (which is unrealistic for everyone given the job market) are given more time by advisors and more opportunities to collaborate, network, and attend conferences, and they are generally treated more respectfully while those who don't aim for academia are neglected, sometimes to the point of being pushed out of the program. Students are sometimes targeted, and even bullied, by faculty to the point where they lose all interest in pursuing academia at all due to the toxic environment. It mostly goes undiscussed as no one wants to deal with retaliation, or the students just simply leave the program. Obviously not all of the faculty create this type of environment, but the ones that do are senior enough that the students really can't do anything about it.

- This survey would be more effective with detailed questions about curricula and requirements. For example, each faculty member typically does an excellent job teaching their course, but there is very little connection between faculty. Specifically, they often assume we know things that we "should" have learned in another professor's course whether we did or not. There is often several wasted days of redundant information between courses. While faculty should certainly be free to design their courses how they like, the graduate students have the unique perspective of having taken all the courses. Something none of the faculty have done. Yet our input in structuring and improving the overall program is not sought very often.

- Wonderful department to be a part of.

  Would like to see the department hire a researcher that studies globular clusters. I think that would be a good fit with the current chemistry of the department, while adding a new dynamic.

- Poor stipends.

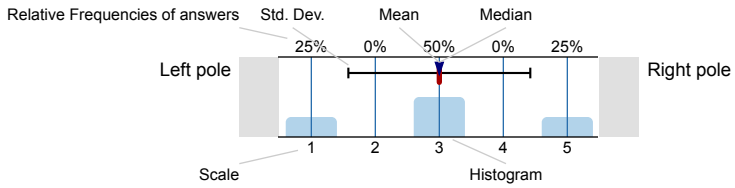
Physics Graduate Students

No. of responses = 18

Survey Results

Legend

Question text

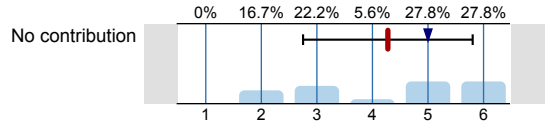


n=No. of responses
av.=Mean
md=Median
dev.=Std. Dev.
ab.=Abstention

General Learning Outcomes

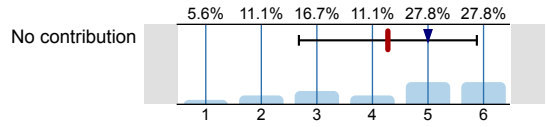
To what degree is your major program of study contributing to your doing or achieving the following:

Writing clearly and effectively



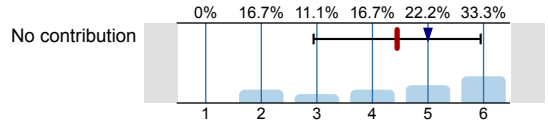
n=18
av.=4.28
md=5
dev.=1.53

Speaking clearly and effectively



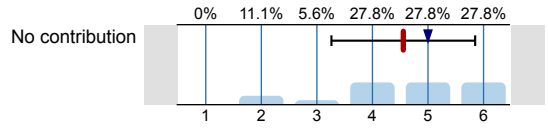
n=18
av.=4.28
md=5
dev.=1.6

Locating and organizing information from multiple sources



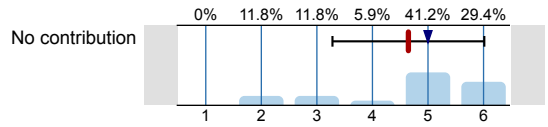
n=18
av.=4.44
md=5
dev.=1.5

Awareness of historical contexts surrounding your area of study



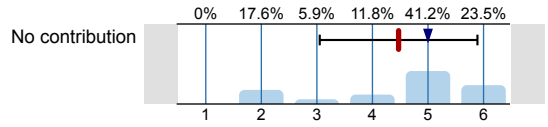
n=18
av.=4.56
md=5
dev.=1.29

Demonstrating competence in specific research methods appropriate to your area of specialization



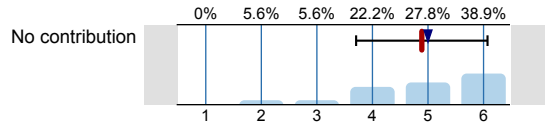
n=17
av.=4.65
md=5
dev.=1.37

Effectively evaluate implications and applications of research in your field



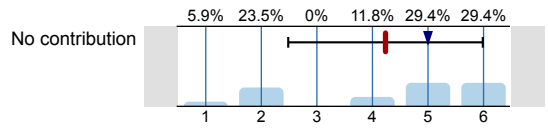
n=17
av.=4.47
md=5
dev.=1.42

Collaborating effectively with colleagues (e.g., other students, researchers, faculty)



n=18
av.=4.89
md=5
dev.=1.18

Knowledge about the tenets of ethical practice

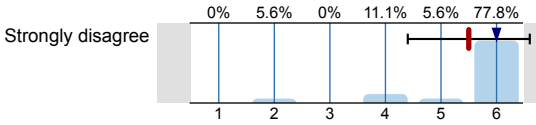


n=17
av.=4.24
md=5
dev.=1.75

Program Preparation/Challenge

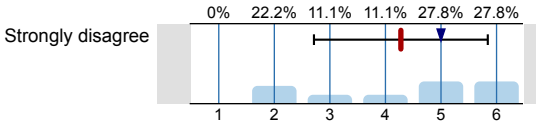
Please indicate the extent to which you agree with the following statements:

My program of study is academically challenging.



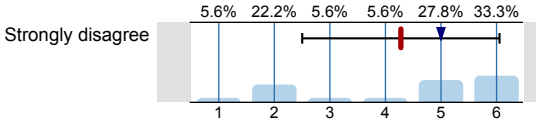
n=18
av.=5.5
md=6
dev.=1.1

My program requirements are clear to me.



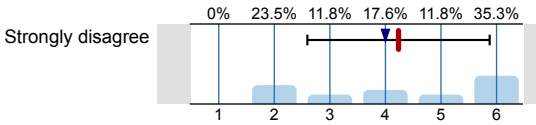
n=18
av.=4.28
md=5
dev.=1.56

There are sufficient research opportunities available to me in the department.



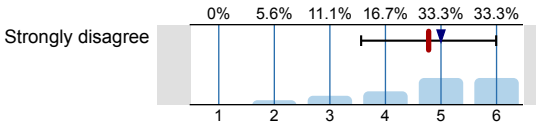
n=18
av.=4.28
md=5
dev.=1.78

My program's curriculum is broad enough to prepare me for my career choice.



n=17
av.=4.24
md=4
dev.=1.64

Overall, instructors in the department stress high quality work from students.

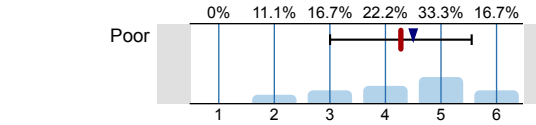


n=18
av.=4.78
md=5
dev.=1.22

Program Quality

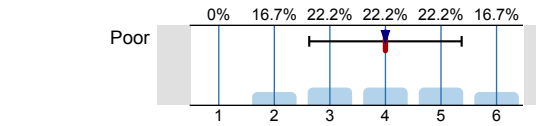
Please rate the following items:

Overall quality of graduate courses in the department



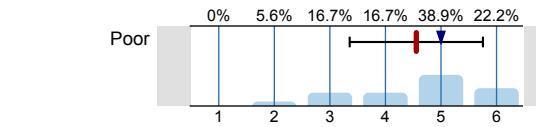
n=18
av.=4.28
md=4.5
dev.=1.27

Availability of graduate courses in the department



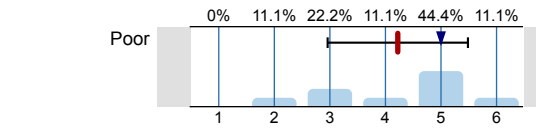
n=18
av.=4
md=4
dev.=1.37

Overall quality of graduate instruction in the department



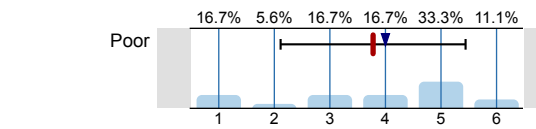
n=18
av.=4.56
md=5
dev.=1.2

Academic advisement available in the department



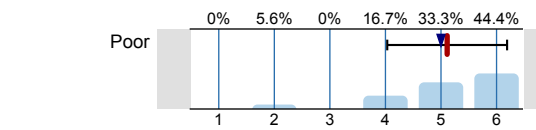
n=18
av.=4.22
md=5
dev.=1.26

Career preparation and guidance available in the department



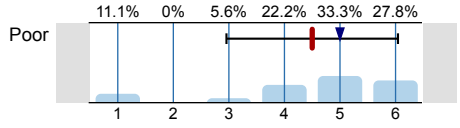
n=18
av.=3.78
md=4
dev.=1.66

Availability of graduate research/teaching assistantships



n=18
av.=5.11
md=5
dev.=1.08

Support for student conference presentations and publications

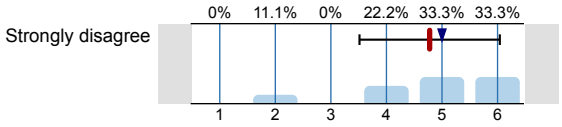


n=18
av.=4.5
md=5
dev.=1.54

Faculty Interaction

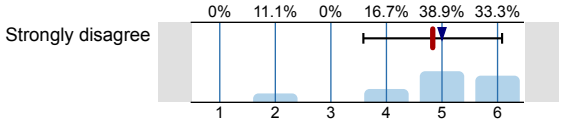
Please indicate the extent to which you agree with the following statements:

In general, faculty in my department are appropriately prepared for the courses they teach.



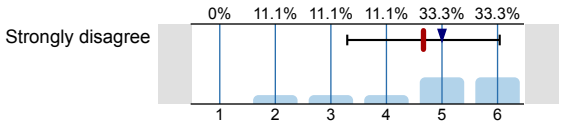
n=18
av.=4.78
md=5
dev.=1.26

In general, faculty are up-to-date in emerging trends and information in my field of study.



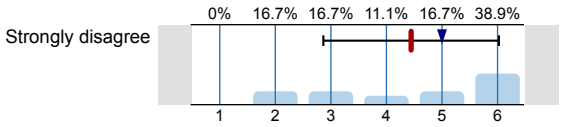
n=18
av.=4.83
md=5
dev.=1.25

In my department, faculty are available to answer questions or discuss my concerns about my program of study.



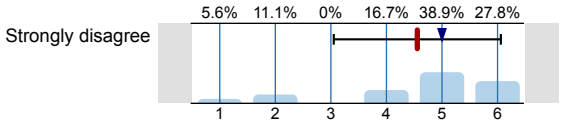
n=18
av.=4.67
md=5
dev.=1.37

In general, faculty in the department motivate me to do my best.



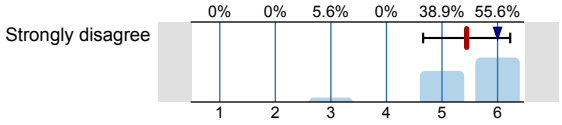
n=18
av.=4.44
md=5
dev.=1.58

Faculty are fair and unbiased in their treatment of students in my graduate program.



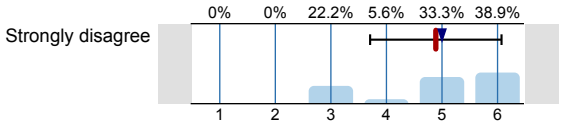
n=18
av.=4.56
md=5
dev.=1.5

Administrative staff in the department are helpful to me.



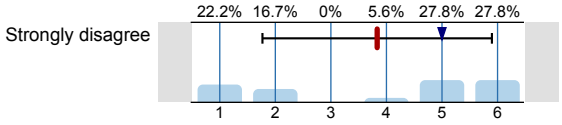
n=18
av.=5.44
md=6
dev.=0.78

My department promotes an environment of inclusiveness and respect.



n=18
av.=4.89
md=5
dev.=1.18

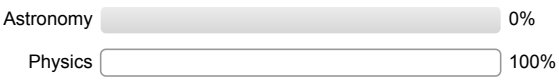
I would recommend my department to other students like myself.



n=18
av.=3.83
md=5
dev.=2.07

Department-specific questions

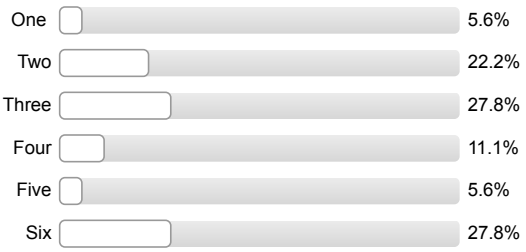
I am currently in the _____ program.



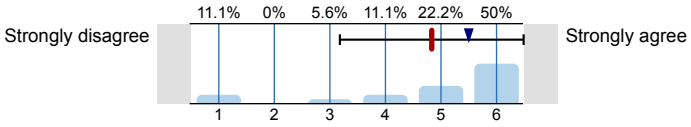
n=18

I have been enrolled in the program for _____ years.

n=18



I am satisfied with the process of finding a research supervisor/mentor.



n=18
av.=4.83
md=5.5
dev.=1.65

Profile

Subgroup: Physics Grad Students

Values used in the profile line: Mean

General Learning Outcomes

To what degree is your major program of study contributing to your doing or achieving the following:

Writing clearly and effectively	No contribution	Significant contribution	n=18	av.=4.28 md=5.00 dev.=1.53	
Speaking clearly and effectively	No contribution	Significant contribution	n=18	av.=4.28 md=5.00 dev.=1.60	
Locating and organizing information from multiple sources	No contribution	Significant contribution	n=18	av.=4.44 md=5.00 dev.=1.50	
Awareness of historical contexts surrounding your area of study	No contribution	Significant contribution	n=18	av.=4.56 md=5.00 dev.=1.29	
Demonstrating competence in specific research methods appropriate to your area of specialization	No contribution	Significant contribution	n=17	av.=4.65 md=5.00 dev.=1.37	
Effectively evaluate implications and applications of research in your field	No contribution	Significant contribution	n=17	av.=4.47 md=5.00 dev.=1.42	
Collaborating effectively with colleagues (e.g., other students, researchers, faculty)	No contribution	Significant contribution	n=18	av.=4.89 md=5.00 dev.=1.18	
Knowledge about the tenets of ethical practice	No contribution	Significant contribution	n=17	av.=4.24 md=5.00 dev.=1.75	

Program Preparation/Challenge

Please indicate the extent to which you agree with the following statements:

My program of study is academically challenging.	Strongly disagree	Strongly agree	n=18	av.=5.50 md=6.00 dev.=1.10	
My program requirements are clear to me.	Strongly disagree	Strongly agree	n=18	av.=4.28 md=5.00 dev.=1.56	
There are sufficient research opportunities available to me in the department.	Strongly disagree	Strongly agree	n=18	av.=4.28 md=5.00 dev.=1.78	
My program's curriculum is broad enough to prepare me for my career choice.	Strongly disagree	Strongly agree	n=17	av.=4.24 md=4.00 dev.=1.64	
Overall, instructors in the department stress high quality work from students.	Strongly disagree	Strongly agree	n=18	av.=4.78 md=5.00 dev.=1.22	

Program Quality

Please rate the following items:

Overall quality of graduate courses in the department	Poor	Excellent	n=18	av.=4.28 md=4.50 dev.=1.27	
Availability of graduate courses in the department	Poor	Excellent	n=18	av.=4.00 md=4.00 dev.=1.37	

Overall quality of graduate instruction in the department	Poor	Excellent	n=18	av.=4.56 md=5.00 dev.=1.20
Academic advisement available in the department	Poor	Excellent	n=18	av.=4.22 md=5.00 dev.=1.26
Career preparation and guidance available in the department	Poor	Excellent	n=18	av.=3.78 md=4.00 dev.=1.66
Availability of graduate research/teaching assistantships	Poor	Excellent	n=18	av.=5.11 md=5.00 dev.=1.08
Support for student conference presentations and publications	Poor	Excellent	n=18	av.=4.50 md=5.00 dev.=1.54

Faculty Interaction

Please indicate the extent to which you agree with the following statements:

In general, faculty in my department are appropriately prepared for the courses they teach.	Strongly disagree	Strongly agree	n=18	av.=4.78 md=5.00 dev.=1.26
In general, faculty are up-to-date in emerging trends and information in my field of study.	Strongly disagree	Strongly agree	n=18	av.=4.83 md=5.00 dev.=1.25
In my department, faculty are available to answer questions or discuss my concerns about my program of study.	Strongly disagree	Strongly agree	n=18	av.=4.67 md=5.00 dev.=1.37
In general, faculty in the department motivate me to do my best.	Strongly disagree	Strongly agree	n=18	av.=4.44 md=5.00 dev.=1.58
Faculty are fair and unbiased in their treatment of students in my graduate program.	Strongly disagree	Strongly agree	n=18	av.=4.56 md=5.00 dev.=1.50
Administrative staff in the department are helpful to me.	Strongly disagree	Strongly agree	n=18	av.=5.44 md=6.00 dev.=0.78
My department promotes an environment of inclusiveness and respect.	Strongly disagree	Strongly agree	n=18	av.=4.89 md=5.00 dev.=1.18
I would recommend my department to other students like myself.	Strongly disagree	Strongly agree	n=18	av.=3.83 md=5.00 dev.=2.07

Department-specific questions

I am satisfied with the process of finding a research supervisor/mentor.	Strongly disagree	Strongly agree	n=18	av.=4.83 md=5.50 dev.=1.65

Comments Report

General Comments

You may use the following box to provide general comments or explanations related to your responses to any of the questionnaire items.

- Support for student conference presentations and publications - I think, this totally depends on the research adviser.

  I would recommend my department to other students like myself. I think another important thing is the students' stipend. Comparing with other state universities, the GSU student stipend is not enough (since GSU is located in the metro area, the living cost is high.)

- It seems that the department set so many unnecessary course requirements for MS/PhD graduation long ago and forget to review it. Please, I recommend that this department survey on other similar institutions and revise the course requirements so that future students will have more time to focus on their research.

- Thank you for considering conducting this "important" survey. If I remember correctly, this is the first time I got an opportunity to participate in this kind of survey from my own department. So this is even more important to me personally. If somebody cares, I look forward to see more surveys on unethical conduct of supervisor(s) that is affecting DEFENSELESS/HELPLESS graduate student(s). Oh, I was assuming that the "unethical" or probably "illegal" things are real. I could be wrong though, or maybe it does not matter. Thanks.

- The word Faculty is too general, I should say all these answers do not apply to all the faculty members. There are exceptions always. I do not understand the purpose of this survey. This is not a useful survey; it does not address some important things, especially about payments and salaries. Cost of everything is increasing but not our salary.

- Poor stipends.

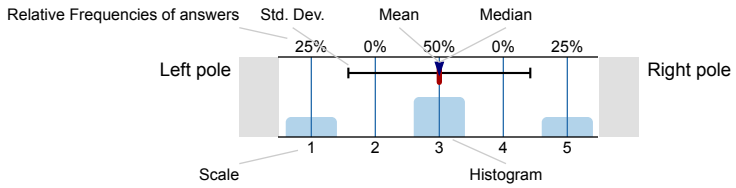
Astronomy Graduate Students

No. of responses = 19

Survey Results

Legend

Question text

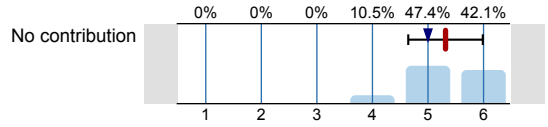


n=No. of responses
av.=Mean
md=Median
dev.=Std. Dev.
ab.=Abstention

General Learning Outcomes

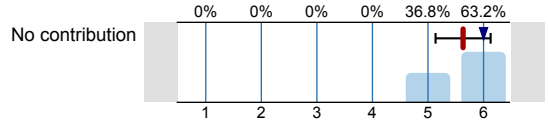
To what degree is your major program of study contributing to your doing or achieving the following:

Writing clearly and effectively



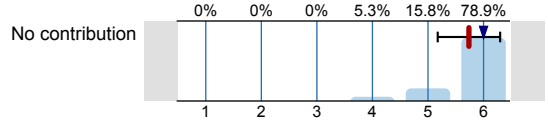
n=19
av.=5.32
md=5
dev.=0.67

Speaking clearly and effectively



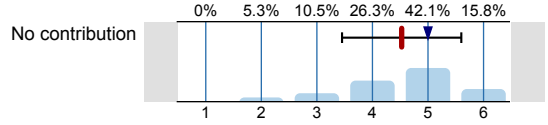
n=19
av.=5.63
md=6
dev.=0.5

Locating and organizing information from multiple sources



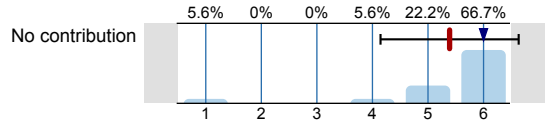
n=19
av.=5.74
md=6
dev.=0.56

Awareness of historical contexts surrounding your area of study



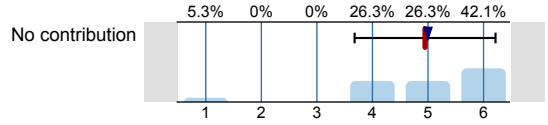
n=19
av.=4.53
md=5
dev.=1.07

Demonstrating competence in specific research methods appropriate to your area of specialization



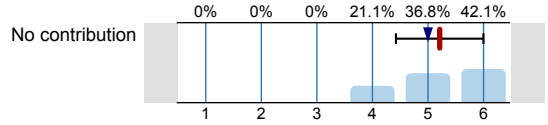
n=18
av.=5.39
md=6
dev.=1.24

Effectively evaluate implications and applications of research in your field



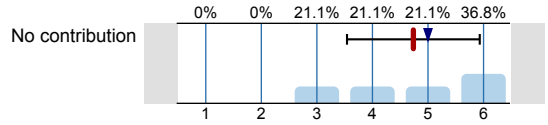
n=19
av.=4.95
md=5
dev.=1.27

Collaborating effectively with colleagues (e.g., other students, researchers, faculty)



n=19
av.=5.21
md=5
dev.=0.79

Knowledge about the tenets of ethical practice

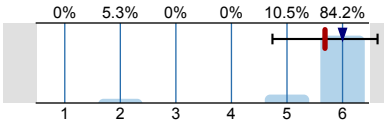


n=19
av.=4.74
md=5
dev.=1.19

Program Preparation/Challenge

Please indicate the extent to which you agree with the following statements:

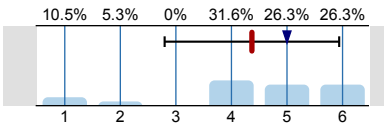
My program of study is academically challenging.

Strongly disagree 

Strongly agree

n=19
av.=5.68
md=6
dev.=0.95

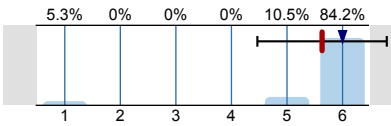
My program requirements are clear to me.

Strongly disagree 

Strongly agree

n=19
av.=4.37
md=5
dev.=1.57

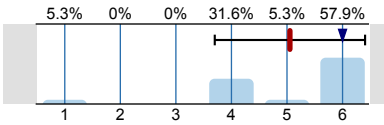
There are sufficient research opportunities available to me in the department.

Strongly disagree 

Strongly agree

n=19
av.=5.63
md=6
dev.=1.16

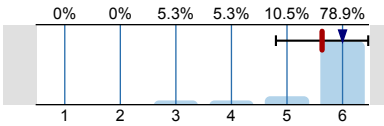
My program's curriculum is broad enough to prepare me for my career choice.

Strongly disagree 

Strongly agree

n=19
av.=5.05
md=6
dev.=1.35

Overall, instructors in the department stress high quality work from students.

Strongly disagree 

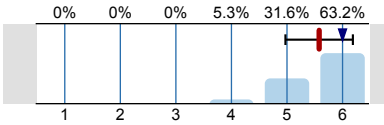
Strongly agree

n=19
av.=5.63
md=6
dev.=0.83

Program Quality

Please rate the following items:

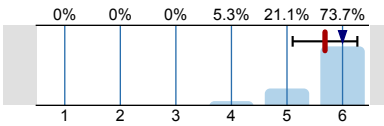
Overall quality of graduate courses in the department

Poor 

Excellent

n=19
av.=5.58
md=6
dev.=0.61

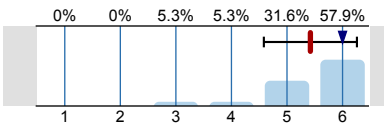
Availability of graduate courses in the department

Poor 

Excellent

n=19
av.=5.68
md=6
dev.=0.58

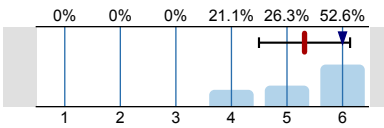
Overall quality of graduate instruction in the department

Poor 

Excellent

n=19
av.=5.42
md=6
dev.=0.84

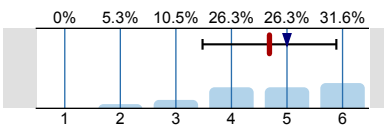
Academic advisement available in the department

Poor 

Excellent

n=19
av.=5.32
md=6
dev.=0.82

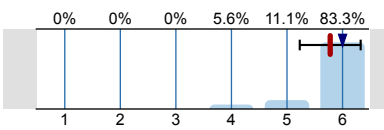
Career preparation and guidance available in the department

Poor 

Excellent

n=19
av.=4.68
md=5
dev.=1.2

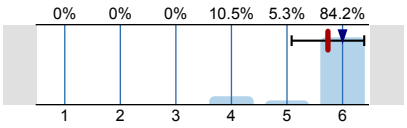
Availability of graduate research/teaching assistantships

Poor 

Excellent

n=18
av.=5.78
md=6
dev.=0.55

Support for student conference presentations and publications

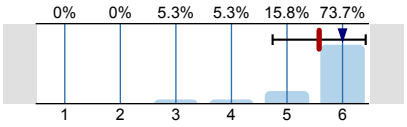


n=19
av.=5.74
md=6
dev.=0.65

Faculty Interaction

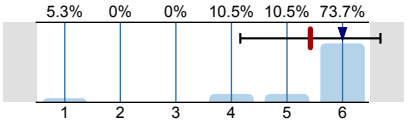
Please indicate the extent to which you agree with the following statements:

In general, faculty in my department are appropriately prepared for the courses they teach.



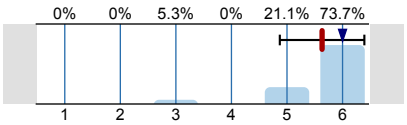
n=19
av.=5.58
md=6
dev.=0.84

In general, faculty are up-to-date in emerging trends and information in my field of study.



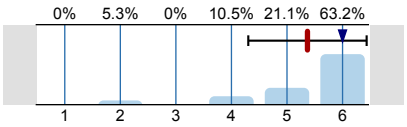
n=19
av.=5.42
md=6
dev.=1.26

In my department, faculty are available to answer questions or discuss my concerns about my program of study.



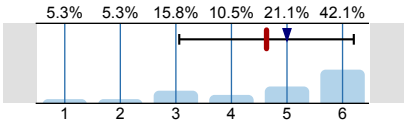
n=19
av.=5.63
md=6
dev.=0.76

In general, faculty in the department motivate me to do my best.



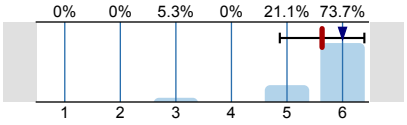
n=19
av.=5.37
md=6
dev.=1.07

Faculty are fair and unbiased in their treatment of students in my graduate program.



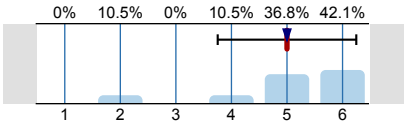
n=19
av.=4.63
md=5
dev.=1.57

Administrative staff in the department are helpful to me.



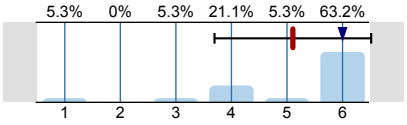
n=19
av.=5.63
md=6
dev.=0.76

My department promotes an environment of inclusiveness and respect.



n=19
av.=5
md=5
dev.=1.25

I would recommend my department to other students like myself.



n=19
av.=5.11
md=6
dev.=1.41

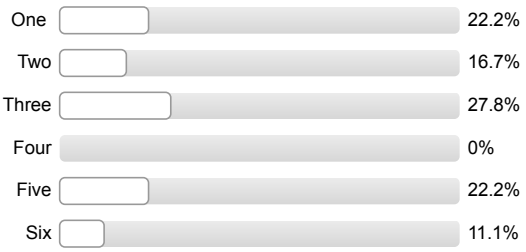
Department-specific questions

I am currently in the _____ program.

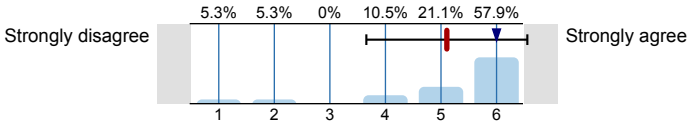
n=19

I have been enrolled in the program for _____ years.

n=18



I am satisfied with the process of finding a research supervisor/mentor.



n=19
av.=5.11
md=6
dev.=1.45

Profile

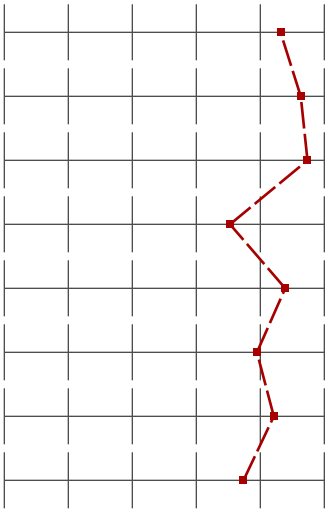
Astronomy Graduate Students

Values used in the profile line: Mean

General Learning Outcomes

To what degree is your major program of study contributing to your doing or achieving the following:

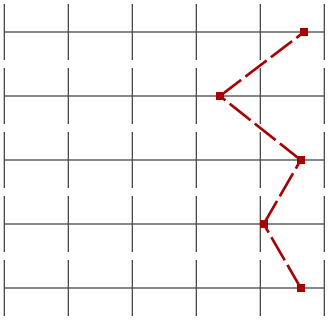
Writing clearly and effectively	No contribution	Significant contribution	n=19	av.=5.32 md=5.00 dev.=0.67
Speaking clearly and effectively	No contribution	Significant contribution	n=19	av.=5.63 md=6.00 dev.=0.50
Locating and organizing information from multiple sources	No contribution	Significant contribution	n=19	av.=5.74 md=6.00 dev.=0.56
Awareness of historical contexts surrounding your area of study	No contribution	Significant contribution	n=19	av.=4.53 md=5.00 dev.=1.07
Demonstrating competence in specific research methods appropriate to your area of specialization	No contribution	Significant contribution	n=18	av.=5.39 md=6.00 dev.=1.24
Effectively evaluate implications and applications of research in your field	No contribution	Significant contribution	n=19	av.=4.95 md=5.00 dev.=1.27
Collaborating effectively with colleagues (e.g., other students, researchers, faculty)	No contribution	Significant contribution	n=19	av.=5.21 md=5.00 dev.=0.79
Knowledge about the tenets of ethical practice	No contribution	Significant contribution	n=19	av.=4.74 md=5.00 dev.=1.19



Program Preparation/Challenge

Please indicate the extent to which you agree with the following statements:

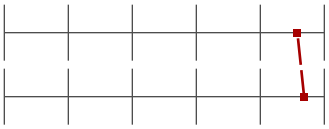
My program of study is academically challenging.	Strongly disagree	Strongly agree	n=19	av.=5.68 md=6.00 dev.=0.95
My program requirements are clear to me.	Strongly disagree	Strongly agree	n=19	av.=4.37 md=5.00 dev.=1.57
There are sufficient research opportunities available to me in the department.	Strongly disagree	Strongly agree	n=19	av.=5.63 md=6.00 dev.=1.16
My program's curriculum is broad enough to prepare me for my career choice.	Strongly disagree	Strongly agree	n=19	av.=5.05 md=6.00 dev.=1.35
Overall, instructors in the department stress high quality work from students.	Strongly disagree	Strongly agree	n=19	av.=5.63 md=6.00 dev.=0.83

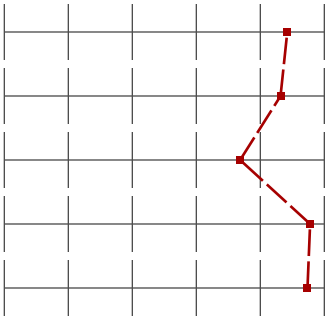


Program Quality

Please rate the following items:

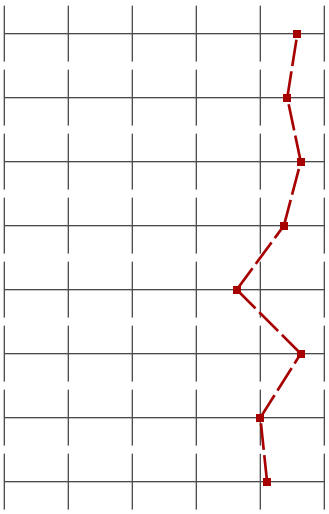
Overall quality of graduate courses in the department	Poor	Excellent	n=19	av.=5.58 md=6.00 dev.=0.61
Availability of graduate courses in the department	Poor	Excellent	n=19	av.=5.68 md=6.00 dev.=0.58



Overall quality of graduate instruction in the department	Poor		Excellent	n=19	av.=5.42 md=6.00 dev.=0.84
Academic advisement available in the department	Poor		Excellent	n=19	av.=5.32 md=6.00 dev.=0.82
Career preparation and guidance available in the department	Poor		Excellent	n=19	av.=4.68 md=5.00 dev.=1.20
Availability of graduate research/teaching assistantships	Poor		Excellent	n=18	av.=5.78 md=6.00 dev.=0.55
Support for student conference presentations and publications	Poor		Excellent	n=19	av.=5.74 md=6.00 dev.=0.65

Faculty Interaction

Please indicate the extent to which you agree with the following statements:

In general, faculty in my department are appropriately prepared for the courses they teach.	Strongly disagree		Strongly agree	n=19	av.=5.58 md=6.00 dev.=0.84
In general, faculty are up-to-date in emerging trends and information in my field of study.	Strongly disagree		Strongly agree	n=19	av.=5.42 md=6.00 dev.=1.26
In my department, faculty are available to answer questions or discuss my concerns about my program of study.	Strongly disagree		Strongly agree	n=19	av.=5.63 md=6.00 dev.=0.76
In general, faculty in the department motivate me to do my best.	Strongly disagree		Strongly agree	n=19	av.=5.37 md=6.00 dev.=1.07
Faculty are fair and unbiased in their treatment of students in my graduate program.	Strongly disagree		Strongly agree	n=19	av.=4.63 md=5.00 dev.=1.57
Administrative staff in the department are helpful to me.	Strongly disagree		Strongly agree	n=19	av.=5.63 md=6.00 dev.=0.76
My department promotes an environment of inclusiveness and respect.	Strongly disagree		Strongly agree	n=19	av.=5.00 md=5.00 dev.=1.25
I would recommend my department to other students like myself.	Strongly disagree		Strongly agree	n=19	av.=5.11 md=6.00 dev.=1.41

Department-specific questions

I am satisfied with the process of finding a research supervisor/mentor.	Strongly disagree		Strongly agree	n=19	av.=5.11 md=6.00 dev.=1.45

Comments Report

General Comments

You may use the following box to provide general comments or explanations related to your responses to any of the questionnaire items.

- -Make qualifier exam requirements and expectations clear in a written document.
  -Grade qualifier exams without names at the top if not already being done (quantitate questions with the names removed, qualitative questions typed).
- I love this place!
- Program requirements are unclear and seem to change often.
- There is a distinct disparity in how students are treated and the opportunities they are given in the department. In general, the students who aim to go into academia (which is unrealistic for everyone given the job market) are given more time by advisors and more opportunities to collaborate, network, and attend conferences, and they are generally treated more respectfully while those who don't aim for academia are neglected, sometimes to the point of being pushed out of the program. Students are sometimes targeted, and even bullied, by faculty to the point where they lose all interest in pursuing academia at all due to the toxic environment. It mostly goes undiscussed as no one wants to deal with retaliation, or the students just simply leave the program. Obviously not all of the faculty create this type of environment, but the ones that do are senior enough that the students really can't do anything about it.
- This survey would be more effective with detailed questions about curricula and requirements. For example, each faculty member typically does an excellent job teaching their course, but there is very little connection between faculty. Specifically, they often assume we know things that we "should" have learned in another professors course whether we did or not. There is often several wasted days of redundant information between courses. While faculty should certainly be free to design their courses how they like, the graduate students have the unique perspective of having taken all the courses. Something none of the faculty have done. Yet our input in structuring and improving the overall program is not sought very often.
- Wonderful department to be a part of.

  Would like to see the department hire a researcher that studies globular clusters. I think that would be a good fit with the current chemistry of the department, while adding a new dynamic.

ACADEMIC PROGRAM REVIEW
DEPARTMENT OF PHYSICS & ASTRONOMY
GRADUATE STUDENT SURVEY COMPARISONS
SPRING 2017

Department N = 38
Dept. response rate = 54%

University (29 Departments) N = 1311
University response rate average = 44%

Table 1. *General Learning Outcomes*

To what degree is your major program of study contributing to your doing or achieving the following:	Dept. M	Univ. M
Writing clearly and effectively	4.76	4.94
Speaking clearly and effectively	4.97	4.72
Locating and organizing information from multiple sources	5.08	5.01
Awareness of historical contexts surrounding your area of study	4.50	4.85
Demonstrating competence in specific research methods appropriate to your area of specialization	5.03	4.96
Effectively evaluate implications and applications of research in your field	4.73	4.94
Collaborating effectively with colleagues (e.g., other students, researchers, faculty)	5.08	4.73
Knowledge about the tenets of ethical practice	4.54	4.95

Note. Mean scale: 1=No contribution to 6=Significant contribution.

Table 2. *Program Preparation/Challenge*

Please indicate the extent to which you agree with the following statements:	Dept. M	Univ. M
My program of study is academically challenging.	5.61	5.12
My program requirements are clear to me.	4.34	4.91
There are sufficient research opportunities available to me in the department.	4.97	4.45
My program's curriculum is broad enough to prepare me for my career choice.	4.65	4.69
Overall, instructors in the department stress high quality work from students.	5.21	5.17

Note. Mean scale: 1=Strongly disagree to 6=Strongly agree.

Table 3.

Please indicate the extent to which you agree with the following statements:	Dept. M	Univ. M
Overall quality of graduate courses in the department	4.89	4.90
Availability of graduate courses in the department	4.84	4.34
Overall quality of graduate instruction in the department	4.97	4.94
Academic advisement available in the department	4.76	4.58
Career preparation and guidance available in the department	4.16	4.36
Availability of graduate research/teaching assistantships	5.41	4.58
Support for student conference presentations and publications	5.03	4.40

Note. Mean scale: 1=Poor to 6=Excellent.

Table 4. Faculty Interaction

Please indicate the extent to which you agree with the following statements:	Dept. M	Univ. M
In general, faculty in my department are appropriately prepared for the courses they teach.	5.18	5.27
In general, faculty are up-to-date in emerging trends and information in my field of study.	5.13	5.25
In my department, faculty are available to answer questions or discuss my concerns about my program of study.	5.18	5.15
In general, faculty in the department motivate me to do my best.	4.92	5.08
Faculty are fair and unbiased in their treatment of students in my graduate program.	4.61	4.91
Administrative staff in the department are helpful to me.	5.53	5.12
My department promotes an environment of inclusiveness and respect.	4.95	5.08
I would recommend my department to other students like myself.	4.42	4.91

Note. Mean scale: 1=Strongly disagree to 6=Strongly agree.

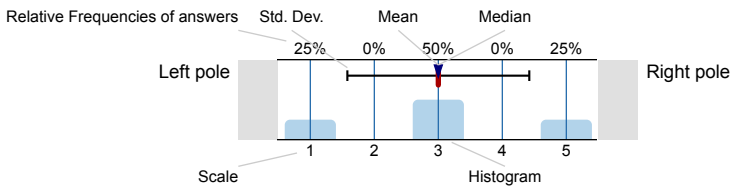
College of Arts and Sciences

Department of Physics & Astronomy Graduate Alumni Survey
No. of responses = 17
Response rate = 31%

Survey Results

Legend

Question text

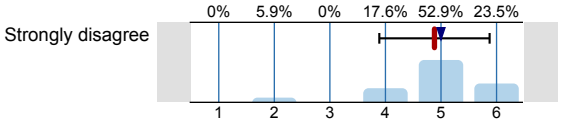


n=No. of responses
av.=Mean
md=Median
dev.=Std. Dev.
ab.=Abstention

General Outcomes

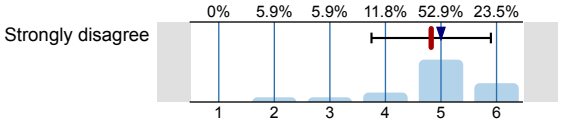
Please indicate the extent to which you agree with the following statements:

My program of study has made a positive contribution to the quality of my life.



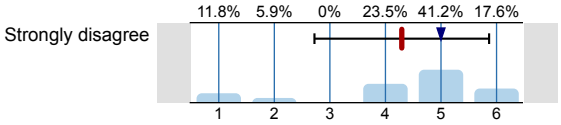
n=17
av.=4.88
md=5
dev.=0.99

I have applied the skills I learned in my program to help resolve issues I've faced in my professional life.



n=17
av.=4.82
md=5
dev.=1.07

Overall, I was satisfied with my degree program.



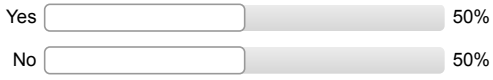
n=17
av.=4.29
md=5
dev.=1.57

Employment

Are you currently employed?

n=17

Have you been employed at any time over the last year?



n=2

Please indicate the general area of employment.

n=16

College Faculty/Administration	18.8%
Education K-12	12.5%
Government/Public Administration	6.3%
Non-Profit or Community Org.	6.3%
Other	56.3%

Skills and Employment

Research skills

n=16

Yes	93.8%
No	6.3%

Communication skills (writing and speaking)

n=15

Yes	86.7%
No	13.3%

Ability to interpret data/information in a critical manner

n=15

Yes	93.3%
No	6.7%

Ability to analyze problems from different perspectives

n=15

Yes	93.3%
No	6.7%

Ability to work with diverse populations

n=15

Yes	73.3%
No	26.7%

Research skills

n=16

Yes	87.5%
No	12.5%

Communication skills (writing and speaking)

n=16

Yes	75%
No	25%

Ability to interpret data/information in a critical manner

n=16

Yes	93.8%
No	6.3%

Ability to analyze problems from different perspectives

n=16

Ability to work with diverse populations

n=16

Research skills

n=15

Communication skills (writing and speaking)

n=15

Ability to interpret data/information in a critical manner

n=15

Ability to analyze problems from different perspectives

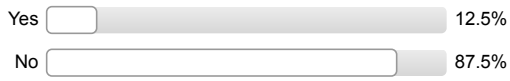
n=15

Ability to work with diverse populations

n=15

Further Education

Are you currently enrolled in a graduate program?



n=16

What degree are you seeking?

n=2

Ph.D.	100%

Since graduating from Georgia State, have you earned an additional degree(s)?

n=17

Yes	5.9%
No	94.1%

Profile

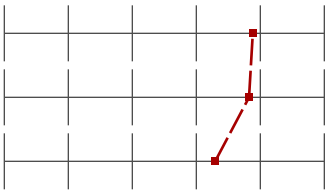
Academic Program Review
College of Arts and Sciences
Department of Physics & Astronomy Graduate Alumni Survey

Values used in the profile line: Mean

General Outcomes

Please indicate the extent to which you agree with the following statements:

My program of study has made a positive contribution to the quality of my life.	Strongly disagree	Strongly agree	n=17 av.=4.88 md=5.00 dev.=0.99
I have applied the skills I learned in my program to help resolve issues I've faced in my professional life.	Strongly disagree	Strongly agree	n=17 av.=4.82 md=5.00 dev.=1.07
Overall, I was satisfied with my degree program.	Strongly disagree	Strongly agree	n=17 av.=4.29 md=5.00 dev.=1.57



Comments Report

Employment

Other:

- Government Research Agency
- Government sponsored postdoc
- IT
- Post-doctoral Fellow
- Postdoc
- Science
- research
- science research
- science/research

Further Education

What is your program of study?

- Graduate Study
- Physics and Astronomy
- seismology

At what institution are you pursuing your degree?

- Georgia State University
- university of potsdam

Please tell us what additional degree you earned, the program of study, and the degree-granting institution.

- MAT From KSU

Overall Evaluation

Looking back, what aspects of your program do you believe were the most valuable in contributing to your earning a degree at Georgia State?

- Funding enabled me to complete my degree, while the support of several of the professors kept me pushing forward and led to my eventual success in completing projects and getting a degree.
- Going to conferences
- Professional development such as conferences, summer schools, and other opportunities. It is imperative that the department encourage students to apply for summer programs or other professional development that would help their careers -- **especially if the professional development does not involve research**. Since less than a quarter of students will end up with professional research jobs due to the lack of postdocs and faculty positions, students **need** training in other areas that they can only get outside the department. Currently, the environment (which includes the way in which faculty, postdocs, and students consider and discuss these issues) is one of outright * discouragement*, and this needs to change if the department is invested in the future of their graduate students.
- Research and publication of scientific findings.
- Research section
- Brian Thoms. There was nothing else at Georgia State that I found of value other than my graduate adviser. He created a positive and supportive environment in a place where there otherwise would have been none.
- Research programs and teaching programs

What kinds of improvements would you suggest the department make in order to enhance the educational experience of current students in the program?

- Better reduce the teaching load to graduate student and provide more opportunity to get involved in research.

- In order to enhance the educational experience of *all* students in the program, it is of the utmost and urgent necessity (and I say this with no exaggeration) for the department to intentionally inspect and improve the climate for marginalized students (including women of color, men of color, white women, disabled people, and sex and gender minorities). It is no longer acceptable to deem the department a “friendly” place for all students and leave it at that. Marginalized students are struggling and suffering because of a deliberate and willful ignorance on the part of the department and its administration. Rather than claiming not to “see” students’ differences in identity, the department must act from the knowledge that bias exists in our community and actively work to address that. The best and most efficient way to do this is to invest departmental and university funds to hire an equity/inclusion/diversity expert who can help make specific recommendations.

  Improvements that must be made to change the current toxic environment for marginalized students include (but are not limited to):

  1. Assess the financial need of marginalized students -- especially men and women of color, disabled students, and transgender students, who are statistically more likely to be low-income due to institutional bias -- and allocate funding that specifically addresses the needs of those students. While such a resource may seem “unfair” to privileged students, this initiative only levels the playing field for marginalized students and allows them equitable access to a quality education. The funds could be used to:

  a) Increase the stipends of marginalized students, who may not be able to rely on financial help from family and are more likely to acquire student loans, unlike many privileged students
  b) Pay for initial moving and housing costs
  c) Pay for health insurance or fees, which are known to be an undue burden on marginalized students and may prevent them from attending the program altogether, or cause them to take another job, which reduces their ability to perform as well as privileged students
  d) Fund marginalized students to attend events and meetings that provide support and cater to their marginalized identities. Examples include (but are not limited to) the National Society of Black Physicists, the Society for the Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS), the National Society of Hispanic Professionals, Out in STEM (oSTEM), and many others.
  e) Fund marginalized students to attend professional conferences in their respective fields, such as the American Astronomical Society (AAS), the American Physical Society (APS), or smaller conferences in the students’ subfield of research.
  2. Require faculty to attend “Safe Zone” Training that specifically addresses issues concerning marginalized students, especially men and women of color, disabled students, transgender students, and LGB+ students. Such training programs are already in place and are offered for faculty and staff free of cost from the GSU Multicultural Center.
  3. Require faculty who are advising marginalized students to take additional training and precautions to ensure the safety and comfort of their students.
  4. Regularly survey students to determine if the toxic climate is improving and adjust measures and initiatives as needed.

  Ultimately, the responsibility to change the climate in the department in order to improve retention and increase success of marginalized students lies solely in the hands of the administration, with support from the university. These recommendations are concrete steps that have been proven to work by other programs. Failure to implement them indicates a lack of care for marginalized students despite much lip service to the contrary.

- Let professors devote more time on class preparation besides their research.

- More Post Doctoral Programs and increase in financial support

- More team building activities - it is important to feel camaraderie.
  Get rid of the qualifying exam, so students can focus on research earlier.
  Less teaching duties, so students can focus more on research earlier in their graduate career.

- While the department has made considerable progress since I started there, I believe the most important thing they can do is ensure students get the tools necessary for success in today's job market. Primarily, this involves exposure to and mastery of techniques that apply to current and future jobs instead of the tools that were important when the professors were in school/early in their careers. I also think it would be extremely useful if there were more check-ins along the way for graduate students, as it is easy to fall behind if your advisor is not on top of things. Perhaps even appointing/selecting a formal mentor in addition to your academic advisor.

- Fire most of the professors. They create a hostile work environment for men, women, basically anyone with a pulse.

Department specific questions.

We currently send out a Department of Physics and Astronomy Newsletter annually, and we post news items on the GSU Physics and Astronomy Facebook page. Please offer any suggestions about how we may better stay in touch with you.

- I hope it will be great if we receive the notice when Newsletter is sent out.
- That is good enough.
- Through email or mail.
- Throw an alumni picnic for past grads to come back and see everyone at the department
- The only person i want to speak with at Georgia State is my graduate adviser.

General Comments

You may use the following box to provide general comments or explanations related to your responses to any of the questionnaire items.

- Dr. He did a great job of making sure my skills could translate well to a job in both academia and industry. I graduated just one year ago, and I'm already a Technical Lead and Project Manager on a multimillion dollar, multi-year data science project for the US Navy. I'm very grateful for the skills I picked up while working toward my PhD in physics at GSU.
- I feel like I have made myself clear.

ACADEMIC PROGRAM REVIEW
DEPARTMENT OF PHYSICS & ASTRONOMY
GRADUATE ALUMNI SURVEY COMPARISONS
SPRING 2017

Dept. N = 17
Dept. response rate = 31%

University (29 Departments) N = 731
University response rate average = 29%

General Outcomes

Table 1.

Please indicate the extent to which you agree with the following statements:	Dept. M	Univ. M
My program of study has made a positive contribution to the quality of my life.	4.88	5.02
I have applied the skills I learned in my program to help resolve issues I've faced in my professional life.	4.82	4.90
Overall, I was satisfied with my degree program.	4.29	4.83

Note. Mean scale: 1=Strongly disagree to 6=Strongly agree.

Employment

Table 2.
Are you currently employed?

Dept.		Univ.	
N = 17	%	N= 728	%
Yes	88.2		91.1
No	11.8		8.9

Table 3.
Have you been employed at any time over the last year?

Dept.		Univ.	
N = 2	%	N= 67	%
Yes	50.0		53.7
No	50.0		46.3

Table 4.
Please indicate the general area of employment.

	Dept.		Univ.	
	N = 16	%	N = 686	%
Agriculture/Natural Resources		.0		.3
Arts		.0		.6
Business/Finance		.0		7.6
College Faculty/Administration		18.8		19.4
Counseling/Mental Health		.0		4.7
Education K-12		12.5		13.1
Government/Public Administration		6.3		9.2
Hospitality/Tourism		.0		1.6
Journalism/Publication		.0		.0
Law		.0		1.3
Library Work		.0		.3
Manufacturing/Construction		.0		.4
Marketing		.0		2.6
Media/Communication		.0		.6
Medicine/Nursing		.0		14.1
Non-Profit or Community Org.		6.3		7.4
Religious Organization		.0		.4
Transportation		.0		.7
Other		56.3		15.6

Table 5. *Skills and Employment* ***(Department)***

The following questions focus on the skills you may have learned in your degree program at Georgia State and whether you listed them on your resume, discussed them during your job interview, or use(used) them in your job.

Department	List on resume		Discuss in job interview		Using(used) on job	
	Yes	No	Yes	No	Yes	No
	%	%	%	%	%	%
Research skills	93.8	6.3	87.5	12.5	86.7	13.3
Communication skills (writing and speaking)	86.7	13.3	75.0	25.0	93.3	6.7
Ability to interpret data/information in a critical manner.	93.3	6.7	93.8	6.3	93.3	6.7
Ability to analyze problems from different perspectives	93.3	6.7	93.8	6.3	93.3	6.7
Ability to work with diverse populations	73.3	26.7	75.0	25.0	86.7	13.3

Table 6. *Skills and Employment* ***(University)***

University	List on resume		Discuss in job interview		Using(used) on job	
	Yes	No	Yes	No	Yes	No
	%	%	%	%	%	%
Research skills	59.9	40.1	56.6	43.4	78.6	21.4
Communication skills (writing and speaking)	71.5	28.5	84.5	15.5	97.0	3.0
Ability to interpret data/information in a critical manner.	65.9	34.1	73.3	26.7	90.4	9.6
Ability to analyze problems from different perspectives	62.4	37.6	80.7	19.3	94.5	5.5
Ability to work with diverse populations	65.5	34.5	77.7	22.3	91.9	8.1

Further Education

Table 6.
Are you currently enrolled in a graduate program?

Dept.		Univ.	
N = 16	%	N= 727	%
Yes	12.5		10.6
No	87.5		89.4

Table 7.
What degree are you seeking?

	Dept.		Univ.	
	N = 2	%	N = 93	%
Ed.D.		.0		1.1
J.D.		.0		1.1
M.A.		.0		3.2
M.B.A.		.0		4.3
M.D.		.0		.0
M.Div.		.0		1.1
M.F.A.		.0		.0
M.S.		.0		5.4
M.S.W.		.0		.0
M.S.L.S.		.0		.0
M.T.S.		.0		.0
Ph.D.		100.0		58.1
Th.D.		.0		.0
Other		.0		25.8

Table 8.
Since graduating from Georgia State, have you earned an additional degree(s)?

Dept.		Univ.	
N = 17	%	N= 708	%
Yes	5.9		4.0
No	94.1		96.0

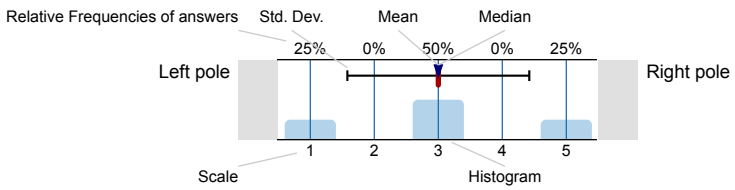
College of Arts and Sciences

Department of Physics & Astronomy - Faculty Survey
No. of responses = 24
Response rate = 75%

Survey Results

Legend

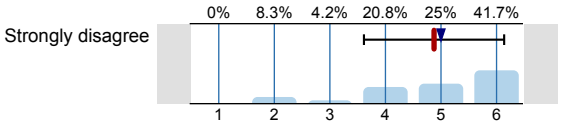
Question text



n=No. of responses
av.=Mean
md=Median
dev.=Std. Dev.
ab.=Abstention

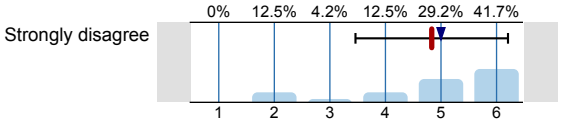
University/Department Engagement
Please indicate the extent to which you agree with the following statements:

I feel involved in the process of setting departmental objectives.



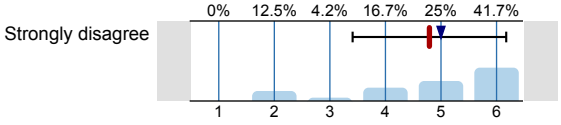
n=24
av.=4.88
md=5
dev.=1.26

I have adequate opportunities to influence decisions made in the department about our programs.



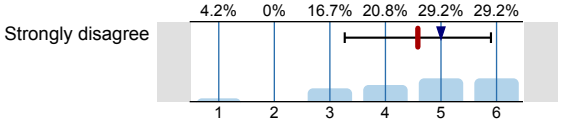
n=24
av.=4.83
md=5
dev.=1.37

I feel comfortable expressing my views in departmental meetings.



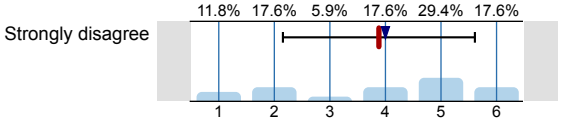
n=24
av.=4.79
md=5
dev.=1.38

I am proud of my department's standing in the national academic community.



n=24
av.=4.58
md=5
dev.=1.32

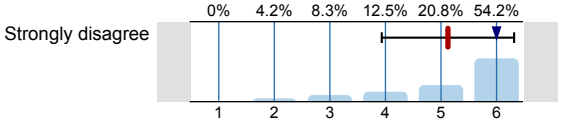
I find my involvement in university committee work to be a constructive use of my time.



n=17
av.=3.88
md=4
dev.=1.73
ab.=7

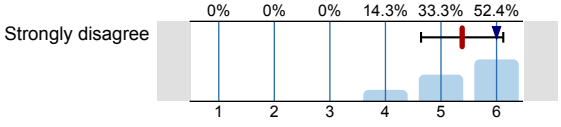
Career Goals
Please indicate the extent to which you agree with the following statements:

My professional career goals are consistent with the department's expectations.



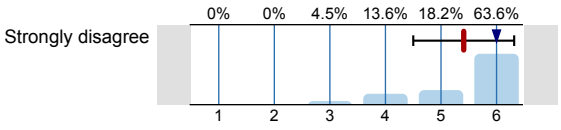
n=24
av.=5.13
md=6
dev.=1.19

My department has reasonable requirements for achieving tenure and promotion.



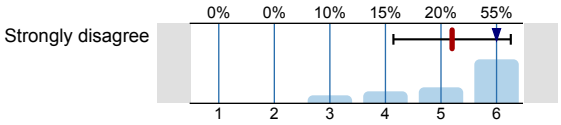
n=21
av.=5.38
md=6
dev.=0.74
ab.=2

I feel the promotion and tenure process has been clearly explained to me.



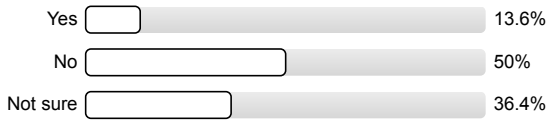
n=22
av.=5.41
md=6
dev.=0.91
ab.=2

I feel adequate support and assistance are available to me to achieve tenure and promotion.



n=20
av.=5.2
md=6
dev.=1.06
ab.=4

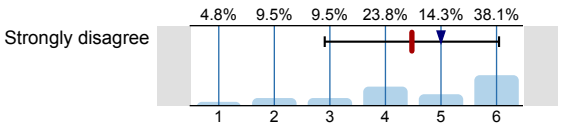
My plans for career development include possible employment in another university than Georgia State.



n=22

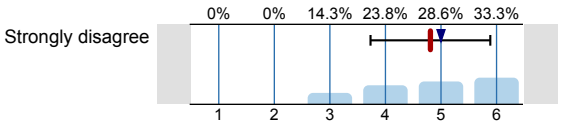
Research
Please indicate the extent to which you agree with the following statements:

I have adequate support in securing funding for research.



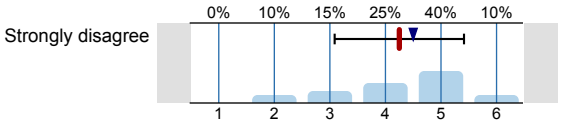
n=21
av.=4.48
md=5
dev.=1.57
ab.=3

I have adequate resources (e.g., library, labs, technology) to do my research.



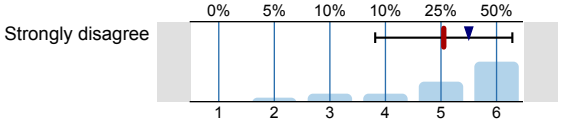
n=21
av.=4.81
md=5
dev.=1.08
ab.=3

I have adequate time for scholarly research.



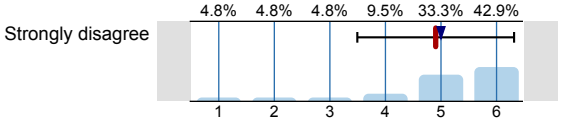
n=20
av.=4.25
md=4.5
dev.=1.16
ab.=3

I have sufficient opportunities to collaborate with other researchers at Georgia State.



n=20
av.=5.05
md=5.5
dev.=1.23
ab.=4

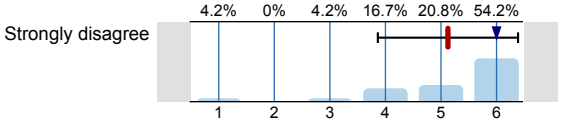
My colleagues value my research/scholarship.



n=21
av.=4.9
md=5
dev.=1.41
ab.=3

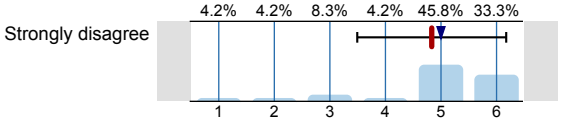
Department Climate
Please indicate the extent to which you agree with the following statements.

My department actively supports a shared and inclusive understanding of diversity.



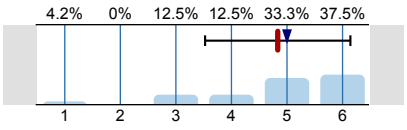
n=24
av.=5.13
md=6
dev.=1.26

My department encourages teamwork and collegiality.



n=24
av.=4.83
md=5
dev.=1.34

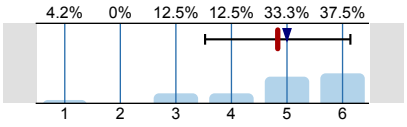
I have developed close relationships with colleagues in my department.

Strongly disagree 

Strongly agree

n=24
av.=4.83
md=5
dev.=1.31

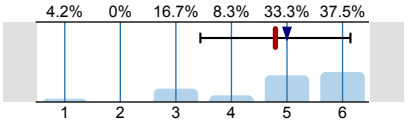
I believe my workload is reasonable.

Strongly disagree 

Strongly agree

n=24
av.=4.83
md=5
dev.=1.31

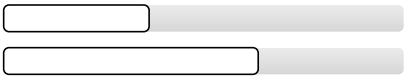
My department enables me to achieve a good balance between work and my personal life.

Strongly disagree 

Strongly agree

n=24
av.=4.79
md=5
dev.=1.35

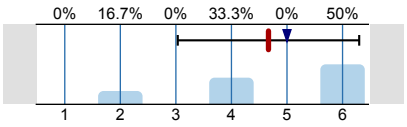
Do you have one or more faculty mentors in the department?



n=22

How helpful has your mentor(s) been in the following areas?

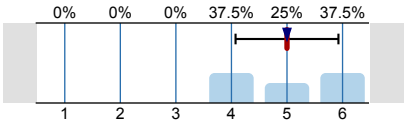
Publishing opportunities

Not helpful 

Very helpful

n=6
av.=4.67
md=5
dev.=1.63
ab.=4

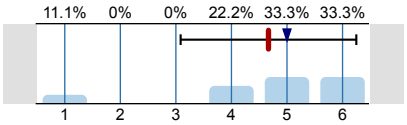
Grant/funding opportunities

Not helpful 

Very helpful

n=8
av.=5
md=5
dev.=0.93
ab.=2

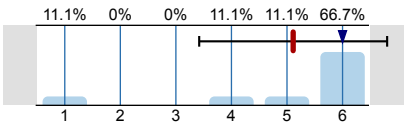
Collaborating in research

Not helpful 

Very helpful

n=9
av.=4.67
md=5
dev.=1.58
ab.=1

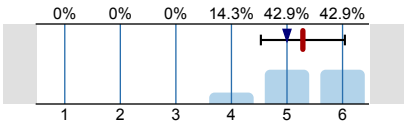
Networking/developing professional contacts

Not helpful 

Very helpful

n=9
av.=5.11
md=6
dev.=1.69
ab.=1

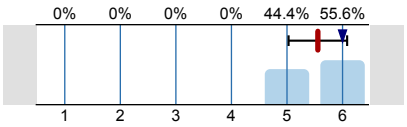
Navigating the promotion and tenure process

Not helpful 

Very helpful

n=7
av.=5.29
md=5
dev.=0.76
ab.=3

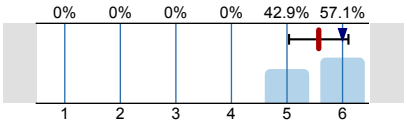
Navigating departmental politics

Not helpful 

Very helpful

n=9
av.=5.56
md=6
dev.=0.53
ab.=1

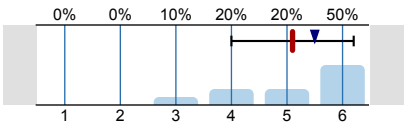
Expanding your leadership opportunities

Not helpful 

Very helpful

n=7
av.=5.57
md=6
dev.=0.53
ab.=3

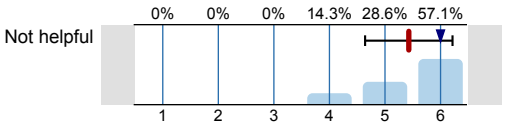
Teaching and classroom matters

Not helpful 

Very helpful

n=10
av.=5.1
md=5.5
dev.=1.1

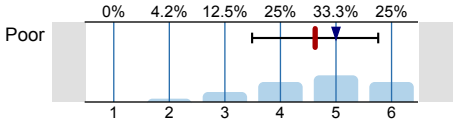
Service/committee work



n=7
av.=5.43
md=6
dev.=0.79
ab.=2

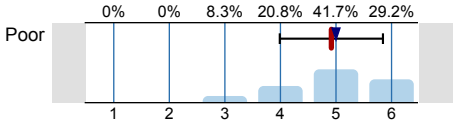
Program
Please rate the quality of the department's academic program.

In general, how would you rate the academic rigor associated with the department's undergraduate program(s)?



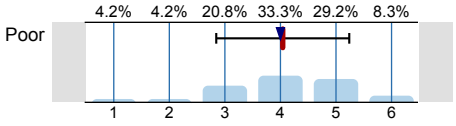
n=24
av.=4.63
md=5
dev.=1.13

In general, how would you rate the academic rigor associated with the department's graduate program (s)?



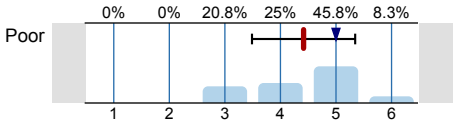
n=24
av.=4.92
md=5
dev.=0.93

How would you rate the academic quality of undergraduate student majors in your department?



n=24
av.=4.04
md=4
dev.=1.2

How would you rate the academic quality of graduate student majors in your department?



n=24
av.=4.42
md=5
dev.=0.93

Profile

Academic Program Review
College of Arts and Sciences
Depaartment of Physics & Astronomy - Faculty Survey

Values used in the profile line: Mean

University/Department Engagement
Please indicate the extent to which you agree with the following statements:

I feel involved in the process of setting departmental objectives.	Strongly disagree / Strongly agree	n=24	av.=4.88 md=5.00 dev.=1.26
I have adequate opportunities to influence decisions made in the department about our programs.	Strongly disagree / Strongly agree	n=24	av.=4.83 md=5.00 dev.=1.37
I feel comfortable expressing my views in departmental meetings.	Strongly disagree / Strongly agree	n=24	av.=4.79 md=5.00 dev.=1.38
I am proud of my department's standing in the national academic community.	Strongly disagree / Strongly agree	n=24	av.=4.58 md=5.00 dev.=1.32
I find my involvement in university committee work to be a constructive use of my time.	Strongly disagree / Strongly agree	n=17	av.=3.88 md=4.00 dev.=1.73

Career Goals
Please indicate the extent to which you agree with the following statements:

My professional career goals are consistent with the department's expectations.	Strongly disagree / Strongly agree	n=24	av.=5.13 md=6.00 dev.=1.19
My department has reasonable requirements for achieving tenure and promotion.	Strongly disagree / Strongly agree	n=21	av.=5.38 md=6.00 dev.=0.74
I feel the promotion and tenure process has been clearly explained to me.	Strongly disagree / Strongly agree	n=22	av.=5.41 md=6.00 dev.=0.91
I feel adequate support and assistance are available to me to achieve tenure and promotion.	Strongly disagree / Strongly agree	n=20	av.=5.20 md=6.00 dev.=1.06

Research
Please indicate the extent to which you agree with the following statements:

I have adequate support in securing funding for research.	Strongly disagree / Strongly agree	n=21	av.=4.48 md=5.00 dev.=1.57
I have adequate resources (e.g., library, labs, technology) to do my research.	Strongly disagree / Strongly agree	n=21	av.=4.81 md=5.00 dev.=1.08
I have adequate time for scholarly research.	Strongly disagree / Strongly agree	n=20	av.=4.25 md=4.50 dev.=1.16
I have sufficient opportunities to collaborate with other researchers at Georgia State.	Strongly disagree / Strongly agree	n=20	av.=5.05 md=5.50 dev.=1.23
My colleagues value my research/scholarship.	Strongly disagree / Strongly agree	n=21	av.=4.90 md=5.00 dev.=1.41

Department Climate
Please indicate the extent to which you agree with the following statements.

My department actively supports a shared and inclusive understanding of diversity.	Strongly disagree	Strongly agree	n=24	av.=5.13 md=6.00 dev.=1.26
My department encourages teamwork and collegiality.	Strongly disagree	Strongly agree	n=24	av.=4.83 md=5.00 dev.=1.34
I have developed close relationships with colleagues in my department.	Strongly disagree	Strongly agree	n=24	av.=4.83 md=5.00 dev.=1.31
I believe my workload is reasonable.	Strongly disagree	Strongly agree	n=24	av.=4.83 md=5.00 dev.=1.31
My department enables me to achieve a good balance between work and my personal life.	Strongly disagree	Strongly agree	n=24	av.=4.79 md=5.00 dev.=1.35

How helpful has your mentor(s) been in the following areas?

Publishing opportunities	Not helpful	Very helpful	n=6	av.=4.67 md=5.00 dev.=1.63
Grant/funding opportunities	Not helpful	Very helpful	n=8	av.=5.00 md=5.00 dev.=0.93
Collaborating in research	Not helpful	Very helpful	n=9	av.=4.67 md=5.00 dev.=1.58
Networking/developing professional contacts	Not helpful	Very helpful	n=9	av.=5.11 md=6.00 dev.=1.69
Navigating the promotion and tenure process	Not helpful	Very helpful	n=7	av.=5.29 md=5.00 dev.=0.76
Navigating departmental politics	Not helpful	Very helpful	n=9	av.=5.56 md=6.00 dev.=0.53
Expanding your leadership opportunities	Not helpful	Very helpful	n=7	av.=5.57 md=6.00 dev.=0.53
Teaching and classroom matters	Not helpful	Very helpful	n=10	av.=5.10 md=5.50 dev.=1.10
Service/committee work	Not helpful	Very helpful	n=7	av.=5.43 md=6.00 dev.=0.79

Program
Please rate the quality of the department's academic program.

In general, how would you rate the academic rigor associated with the department's undergraduate program(s)?	Poor	Excellent	n=24	av.=4.63 md=5.00 dev.=1.13
In general, how would you rate the academic rigor associated with the department's graduate program (s)?	Poor	Excellent	n=24	av.=4.92 md=5.00 dev.=0.93
How would you rate the academic quality of undergraduate student majors in your department?	Poor	Excellent	n=24	av.=4.04 md=4.00 dev.=1.20
How would you rate the academic quality of graduate student majors in your department?	Poor	Excellent	n=24	av.=4.42 md=5.00 dev.=0.93

Comments Report

How helpful has your mentor(s) been in the following areas?

If there are other ways that your mentor has been of help to you, please describe them.

- We do not have assigned mentors, so my answers refer to the help of close colleagues.
- We don't really have specific mentors ... we're all in it together.

Questions submitted by the Department of Physics & Astronomy.

Space needs at GSU are a challenge. What kinds of space are most critical for our advancement (i.e., research laboratory, special teaching laboratory, graduate student offices, etc.)?

- Classroom for approximately 50 students with seating at large tabletops suitable for demonstrations of physical principles for non-lab courses.
  I would also like to have the entire Astronomy faculty with offices in the same location.
- Graduate student offices in close proximity to their faculty mentors.
- Graduate student offices should be in proximity to faculty, rather than scattered in separate buildings.
- Graduate student offices, definitively. In my opinion the Astronomy part of our Department is too fragmented to ensure effective mentoring our new graduate students.
- Maintaining and expanding research lab space and offices for faculty and postdocs is essential for growth.
- Offices.
- One thing I need to mention here is doing lectures in Classroom South and some rooms in Langdale. The lecture rooms are small and do not provide enough writing space. Screen and white board use the same space and I find doing physics lectures there is difficult. It will be better if we can avoid scheduling physics classes there.
- Open areas within department (with tables, chairs, couches) where faculty and students can meet and exchange ideas in more casual setting.
- Our department has grown substantially in new faculty members, graduate students, and external funding over the last few years, but resources from the college and university have not matched this growth. Our most critical need is research lab space - we don't even have enough lab space for our most recent hires. The second greatest need is office space - we are packed in, and no space has been made available for upcoming hires in our centers and clusters.
- Research Laboratory.
- Research Laboratory space is critically needed. Also space for Grad student/post doc offices are also an important requirement.
- Research Laboratory, particularly wet laboratories.
- Research and teaching laboratory.
- Research laboratories are most critical since this holds back growth of existing research programs and recruitment of new faculty capable of bringing new research emphases to the department. The next most critical space need is for adequate office space (in one location) allowing productive and collegial faculty-faculty, grad student-faculty, and grad student-grad student interaction. The fragmented space the department fills prevents us from getting the most benefit from the efforts of the faculty and students.
- Research laboratory.
- Research laboratory space and graduate student offices - as an example we have six graduate students in one office!
- Research space.
- We need more offices for postdocs and graduate students (and possibly new faculty hires!).
- We need special teaching laboratories that are more student centered instead of traditional lab rooms where a TA is clearly in charge.
- grad offices
- research laboratory

New hires have recently been made in special fields with outstanding promise. Do you think that this approach is sufficient to maintain our instructional and research goals?

- Although this program may advance the research goals, this does not sufficiently address the instructional goals.
- Astronomy has been successful with new hires in growing fields, and it appears the instructional needs are being met. Physics appears to be held up by not being successful with a senior hire for the Center for Nano-Optics - junior hires in promising areas (including nano-optics) would yield more success in building large collaborative efforts.
- Faculty mentoring is something very useful. It is also important for lecturers to participate in professional development activities. Lecturers should be made aware of availability of funds for travel and registrations of national and local level meetings to make presentations related to teaching, and attend meetings. It will also be a good motivation and encouragement for lecturers if they can reimburse membership fees for American Association of Physics Teachers.
- Focused hiring in particular directions determined by the top administration based on research grant potential does not allow the department to sufficiently adjust the balance of our research efforts toward constructing an effective graduate program (which is presumably one of the main justifications for having research programs). This approach does not orient the department toward improving its graduate program but instead toward competing for new hires and resources. At the moment, since there have been very few retirements in recent years, there is little opportunity for the department to decide on hiring directions which will best support the overall graduate program. Instructional goals are not even a consideration in the process at this point. The process as it now exists would be appropriate for research center but seems to be totally unbalanced for an educational institution.
- Hope so but not sure.
- I believe it is at this time. Going forward, I believe we must continue to determine means of improving our department's reputation and ranking.
- I think that the 2CI and NGFP programs are a stroke of genius.
- It is a good start.
- It makes it a challenge to grow a department in this way. Hiring senior folks without much or any academic experience (because they have large grants) puts additional burdens on the remaining faculty to shepherd the load of important department duties like graduate adviser, undergraduate adviser, etc.
- No.
- No, it skews the Department. But it's the only thing the administration allows us to do.
- No. Many of these new hires have not contributed to the department in any substantial way, and certainly not at the level commensurate with their job titles. However, simultaneously they have been responsible for redirecting resources away from the other faculty who do contribute. This inequity is sowing the seeds of resentment.
- Not sure.
- Probably yes, but we need to take stock of the range of expertise to insure that our graduate offerings are comprehensive.
- Some new hires are not present in their offices much and their teaching loads are significantly reduced. It is not clear which is the cause and which is the effect. After the first year, new hires should have at least as heavy a teaching load as faculty members who have been in the department for some time. Given the generally higher salaries of some new hires, they should bear at least equal loads on the day-to-day operations of the department.
- This is good, but has to be balanced with a number of more general (i.e., less field-focused) hires, especially hires of more junior faculty.
- Yes, this approach seems likely to give the best results.
- no. we need junior faculty.
- not sufficient need to hire more
- yes (2 Counts)

General Comments

You may use the following box to provide general comments or explanations related to your responses to any of the questionnaire items.

- 1. The climate on the physics side of the department is very poor. Some senior faculty may be perceived as intimidating, making junior faculty afraid to express their views.

  2. The physics faculty (as opposed to astronomy) are separated with a consequence that the two groups are almost never in contact; this demonstrably hurts the cohesion of the department, particularly in the physics area, and materially contributes to the poor climate in the physics part of the department.

  3. The separation of physicists from astronomers also contributes to the estrangement in the department. We would be far better off if ALL of the faculty were located contiguously.

  4. The upper administration seems to believe that the only measure of faculty is how much money they bring in. That is silly; that is wrong; that is counter-productive. What is important is creative output, not income. We need to emphasize output as opposed to income wherever we can. (If that were the criteria, Einstein would never have gotten a Nobel prize!) The upper administration needs to be made aware that their focus on income is skewing the university, including our department.

- GSU is unique in its diversity and its use of data analytics in furthering students' progress.
- I am tenured, so I have answered tenure questions as N/A. However, I believe ample information is given to the relevant faculty members and the department provides enough support towards obtaining tenure.
- In this department, the program questions about graduate work need to be split into Physics and Astronomy separately. The Physics PhD program is relatively weak compared to the Astronomy PhD program. Astronomy is at least a player on the national slate, whereas Physics is not.
- NA
- The Department is on an upward trajectory thanks to new research initiatives associated with new faculty.
  The CeNO and CHARA centers play an important role in our growth and visibility.
- The department environment, particularly in faculty meetings, is tense and difficult. There is a clear lack of collegiality and respect in these meetings. There are squabbles between individuals that create a very uncomfortable atmosphere and hinder faculty members from expressing their opinions, especially faculty members not yet at the top rank since the most contentious individuals are at top rank and will participate in all promotion and tenure decisions. Important discussions are skipped or cut short due to the expected or real harsh reactions of a few individuals. Recent attempts to move more decision making to committees are just too time-consuming and inefficient to be improve the situation very much.
- The faculty and administration should consider creating separate Physics and Astronomy Departments. The two groups already have separate graduate programs, introductory courses, physical locations, research programs (there is no collaboration), and centers. Although the two programs get along, the only things they share in common are an undergraduate B.S. in physics (although there is an astronomy concentration that could be converted to a major), the instrument shop (which could still be shared), and office staff (which could be split relatively easily). Both programs have grown to the point where they can stand alone, and separation would allow each program to enhance its visibility in the scientific community and with potential grad and undergrad students, and pursue its own initiatives without the need to deal with the other's (usually unrelated) issues.
- The level of support in my department is outstanding.
- The physical separation among the groups of physicists and astronomers make the whole as two separate departments. There is very little interaction (academically and socially) between these two groups (including graduate students). The chair seems putting in more effort in promoting the astronomy program over the growth of the physics program.
- We have higher teaching loads than colleagues in similar institutions (that I do research with) and much lower salaries - We don't have enough support for graduate students/ heavy lab teaching loads. The university keeps adding introductory courses sections without suitably matching funds and that results in heavier and heavier teaching loads especially on our graduate students which takes much of their time with very little time left for research.

ACADEMIC PROGRAM REVIEW
DEPARTMENT OF PHYSICS & ASTRONOMY
FACULTY SURVEY COMPARISONS
SPRING 2017

Department N = 24
Dept. response rate = 75%

University (29 Departments) N = 596
University response rate average = 78%

Table 1. *University/Department Engagement*

Please indicate the extent to which you agree with the following statements:	Dept. M	Univ. M
I feel involved in the process of setting departmental objectives.	4.88	4.32
I have adequate opportunities to influence decisions made in the department about our programs.	4.83	4.37
I feel comfortable expressing my views in departmental meetings.	4.79	4.69
I am proud of my department's standing in the national academic community.	4.58	4.69
I find my involvement in university committee work to be a constructive use of my time.	3.88	3.96

Note. Mean scale: 1=Strongly disagree to 6=Strongly agree.

Table 2. *Career Goals*

Please indicate the extent to which you agree with the following statements:	Dept. M	Univ. M
My professional career goals are consistent with the department's expectations.	5.13	4.87
My department has reasonable requirements for achieving tenure and promotion.	5.38	4.63
I feel the promotion and tenure process has been clearly explained to me.	5.41	4.66
I feel adequate support and assistance are available to me to achieve tenure and promotion.	5.20	4.32

Note. Mean scale: 1=Strongly disagree to 6=Strongly agree.

Table 3. *Career Goals*

My plans for career development include possible employment in another university than Georgia State.

	Dept. N = 22	Univ. N = 581
	Dept. %	Univ. %
Yes	13.6	29.8
No	50.0	31.8
Not sure	36.4	38.4

Table 4. *Research*

Please indicate the extent to which you agree with the following statements:	Dept. M	Univ. M
I have adequate support in securing funding for research.	4.48	3.89
I have adequate resources (e.g., library, labs, technology) to do my research.	4.81	4.54
I have adequate time for scholarly research.	4.25	3.69
I have sufficient opportunities to collaborate with other researchers at Georgia State.	5.05	4.46
My colleagues value my research/scholarship.	4.90	4.49

Note. Mean scale: 1=Strongly disagree to 6=Strongly agree.

Table 5. *Department Climate*

Please indicate the extent to which you agree with the following statements:	Dept. M	Univ. M
My department actively supports a shared and inclusive understanding of diversity.	5.12	4.79
My department encourages teamwork and collegiality.	4.83	4.66
I have developed close relationships with colleagues in my department.	4.83	4.75
I believe my workload is reasonable.	4.83	4.33
My department enables me to achieve a good balance between work and my personal life.	4.79	4.29

Note. Mean scale: 1=Strongly disagree to 6=Strongly agree.

Table 6. *Mentoring*

Do you have one or more faculty mentors in the department?

	Dept. N = 22	Univ. N = 548
	Dept. %	Univ. %
Yes	36.4	38.3
No	63.6	61.7

Table 7. *Mentoring*

How helpful has your mentor been in the following areas?	Dept. M	Univ. M
Publishing opportunities	4.67	4.63
Grant/funding opportunities	5.00	4.52
Collaborating in research	4.67	4.65
Networking/developing professional contacts	5.11	4.85
Navigating the promotion and tenure process	5.29	4.97
Navigating departmental politics	5.56	4.98
Expanding your leadership opportunities	5.57	4.97
Teaching and classroom matters	5.10	4.95
Service/committee work	5.43	4.90

Note. Mean scale: 1=Not at all helpful to 6=Very helpful; "NA" excluded from analysis.

Table 8. *Program*

Please rate the quality of the department's program.	Dept. M	Univ. M
In general, how would you rate the academic rigor associated with the department's undergraduate program(s)?	4.63	4.36
In general, how would you rate the academic rigor associated with the department's graduate program(s)?	4.92	4.70
How would you rate the academic quality of undergraduate student majors in your department?	4.04	4.08
How would you rate the academic quality of graduate student majors in your department?	4.42	4.56

Note. Mean scale: 1=Poor to 6=Excellent.

Yohannes Abate
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EDUCATION

June 2006 to July 2009	Postdoctoral Research Student University of California, Berkeley/Lawrence Berkeley National Laboratory (Advisor: Prof. Stephen R. Leone. Development of Apertureless Scanning Near-field Optical Microscopy and Spectroscopy)
May 2001 to June 2006	Ph.D. Physics Physics Department, University of Iowa, Iowa City, IA (Advisor: Prof. Paul Kleiber. Atomic, Molecular and Optical Physics)
June 1997 to June 2000	M.Sc. Physics National Institute of Physics, University of the Philippines (Advisor: Prof. Henry Ramos. Development of Sheet Plasma Negative Ion Source)
Sept.1990 to June 1994	B.Sc. Physics Department of Physics, Addis Ababa University, Ethiopia

HONORS AND AWARDS

June 2016 to May 2012	NSF CARRER AWARD. Title: Nanoscopy of Two-Dimensional Materials, Amount: $550, 000.00
Jan. 2015 to Jan. 2016	Named Scialog Fellow, Scialog Collaborative Innovative Award, Research Corporation for Science Advancement, Amount: Collaborative grant $ 100,000.00
March 2014	Most Valuable Professor, California State University, Long Beach
May 2008	Luis Alvarez Award for Best Experimental Research (American Physical Society California Section)
May 2001	Chancellor Publication Award (University of the Philippines)

PROFESSIONAL EXPERIENCE

Aug. 2014 to Present	Assistant Professor Department of Physics and Astronomy Georgia State university, Atlanta, GA. (http://www.phy-astr.gsu.edu/addis/index.html, under construction)
Aug. 2009 to July 2014	Assistant Professor Department of Physics and Astronomy California State university, Long Beach. (http://www.csulb.edu/~yabate2/home/index.shtml)
June 2006 to July 2009	Postdoctoral Research Associate University of California, Berkeley/Lawrence Berkeley National Laboratory. (Advisor: Prof. Stephen R. Leone, Development of high-resolution apertureless near-field scanning optical microscopy techniques for studies of metallic and semiconductor nanostructures.)
September 2009	Visiting Scientist Max-Planck-Institut für Biochemie, Martinsried, Germany. Nano-Photonics Laboratory, the group of Rainer Hillenbrand. Infrared apertureless near-field microscopy and spectroscopy of silicon nitride nanostructures.
May 2001 to June 2006	Graduate Teaching Assistant Physics Department, University of Iowa, Iowa City, IA.
June 1999 to May 2001	Instructor of Physics National Institute of Physics University of the Philippines, Diliman, Philippines
June 1995 to May 1997	Instructor of Physics Ethiopian Adventist College of Science Shashamane, Ethiopia

PUBLICATIONS

Peer Reviewed Papers

1. **Plasmon Gauge of Phase Coexistence in Vanadium Dioxide Single Crystals**
   Christina McGahan, Sampath Gamage, Jiran Liang, Brendan Cross, Robert E. Marvel, Richard F. Haglund, and Yohannes Abate,
   IOP Nanotechnology 2016, in press NANO-112144.R1

2. **Nanoscopy of Black Phosphorus Degradation**
   Gamage, S., Li, Z., Yakovlev, V. S., Lewis, C., Wang, H., Cronin, S. B. and **Abate, Y.**
   Advanced Materials Int. Volume: 3 Issue: 12 Article Number: 1600121
   doi: 10.1002/admi.201600121 ***(Cover Paper)***

3. **Nanoscopy Reveals Metallic Black Phosphorus**
   Y. Abate, S. Gamage, Z. Li, V. Babicheva, M. H. Javani, H. Wang, S.B. Cronin and M.I. Stockman
   Light: Science & Applications (2016) 5, e16162;
   doi: 10.1038/lsa.2016.162

4. **Control of plasmonic nanoantennas by reversible metal-insulator transition**
   Y. Abate, R. E. Marvel, J. I. Ziegler, S. Gamage, M. H. Javani, M. I. Stockman, R. F. Haglund
   Sci. Rep. 5, 13997;
   doi: 10.1038/srep13997 (2015), Aug 12-13 (2015)

5. **Towards Understanding and Control of Nanoscale Phase Segregation in InGaN Alloys**
   Y. Abate, V.E. Babicheva, V.S. Yakovlev, and N. Dietz,
   (Invited Book Chapter)
   in "III-Nitride Materials and Nano-Structures" Ed: Zhe Chuan Feng,
   Imperial College Press (in press).

6. **Nanoscopy of Phase Separation in $In_xGa_{1-x}N$ Alloys**
   Y. Abate, D.Seidlitz, A. Fali, S. Gamage, V. Babicheva, V. S. Yakovlev, M. I. Stockman, R. Collazo, D. Alden, N. Dietz
   ACS Appl. Mater. Interfaces, 2016, 8 (35), pp 23160–23166
   doi: 10.1021/acsami.6b06766

7. **Optoelectronic and structural properties of InGaN grown by Migration-Enhanced, Plasma-Assisted MOCVD**
   D. Seidlitz, M. K. I. Senevirathna, **Y. Abate**, A. Hoffmann and N. Dietz,
   SPIE Conf. Proc. 9571, paper 9571-25, 14th Int. Conf. SSL & LED-based Illum. Systems Aug 12-13 (2015)

8. **Effect of AlN buffer layers on the structural and optoelectronic properties of InN/AlN/Sapphire heterostructures grown by MEPA-MOCVD**
   M. K. Indika Senevirathna, Daniel Seidlitz, Alireza Fali, Brendan Cross, **Yohannes Abate**, and Nikolaus Dietz
   Proc. SPIE 9954, 15th Int. Conf. on SSL and LED-based Illum. Systems, pp.99540R-1-15 (Sept 7,2016). doi: 10.1117/12.2237957

9. **Near-Field Spectroscopy and Imaging of Single Nanoparticles**
   Yohannes Abate
   The Dekker Encylopedia of Nanoscience and Nanotechnology,
   *(**Invited Book Chapter**).*
   DOI: 10.1081/E-ENN3-120050582

10. **Temperature Gated Thermal Rectifier for Active Heat Flow Control**
    Jia Zhu, Kedar Hippalgaonkar, Sheng Shen, **Yohannes Abate**, Kevin Wang, Sangwook Lee, Juqiao Wu, Xiaobo Yin, Arun Majumdar, and Xiang Zhang
    Nano Lett., 2014, 14 (8), pp 4867-4872

11. **Heat-Induced Coarsening of Layer-by-Layer Assembled Mixed Au and Pd Nanoparticles**
    Young-Seok Shon, Dayeon Judy Shon, Van Troung, Diego J. Gavia, Raul Torrico, and **Yohannes Abate**
    Adv Nano Res. 2014 Feb 1; 2(1): 57-67. doi: 10.12989/anr.2014.2.1.057

12. **Near-field spatial mapping of strongly interacting multiple plasmonic infared antennas**
    Sarah E. Grefe, Daan Leiva, Stefan Mastel, Scott D. Dhuey, Stefano Cabrini, P. James Schuck, and **Yohannes Abate**
    Phys. Chem. Chem. Phys., 2013,15, 18944-18950

13. **Near-field Nanoscale Investigation of Optical Properties of Bi_2Se_3 Thin-films.**
    Sarah E. Grefe, Malinda Tan, Shahab Derakhshan and **Yohannes Abate**
    MRS Online Proceedings Library, 1557, mrss13-1557-y03-08

14. **Real-Space Mapping of Nanoplasmonic Hotspots via Antenna Gap-Loading.**
Stefan Mastel, Sarah E. Grefe, Brendan Cross, Andrew Taber, Scott Dhuey, Stefano Cabrini, James Schuck, and **Yohannes Abate**
Appl. Phys. Lett. 101, 131102 (2012)

15. **Characterization of localized surface plasmon resonance transducers produced from Au_{25} nanoparticle multilayers**
Paul Vaccarello, Linh Tran, Julia Meinen, Chuhee Kwon, **Yohannes Abate**, and Young-Seok Shon
Colloids and Surfaces A: Physicochem. Eng. Aspects 402 (2012) 146-151. doi:10.1016/j.colsurfa.2012.03.041

16. **Nanoscale near-field infrared spectroscopic imaging of silica-shell/gold-core and pure silica nanoparticles**
Zachary Nuño, Brandon Hessler, Bryan Heiberg, Ralph Damato, Terry Dunlap, Young-Seok Shon, and **Yohannes Abate**
J Nanopart Res 14:766 (2012)

17. **Near-field infrared nanoscopy of phonon resonant silica and silica-coated Au nanoparticles**
Zachary Nuño, Brandon Hessler, Jerry Ochoa, Young Shon, Coddie Bonney, and **Yohannes Abate**
NSTI-NanoTech 2011, 1, 840 (2011)

18. **Nanoscale subsurface- and material-specific identification of single nanoparticles**
Zachary Nuño, Brandon Hessler, Jerry Ochoa, Young-Seok Shon, Codi Bonney, and **Yohannes Abate**
Optics Express 19, 20865 (2011)

19. **Nanoscale Infrared Absorption Spectroscopy of Individual Nanoparticles Enabled by Scattering-Type Near-Field Microscopy**
Johannes M. Stiegler, **Yohannes Abate**, Antonija Cvitkovic, Yaroslav Romanyuk, Andreas J. Huber, Stephen R. Leone, and Rainer Hillenbrand (EqualContribution)
ACS Nano 5, 6494 (2011)

20. **Nanometer-scale dielectric constant of Ge quantum dots using apertureless near-field scanning optical microscopy**
Yoshi Ogawa, Fujio Minami, **Yohannes Abate**, Stephen Leone
*App. **Phys. Lett. 96, 063107 (2010)***

21. **Nanometer-scale size dependent imaging of cetyl trimethyl ammonium bromide (CTAB) capped and uncapped gold nanoparticles by apertureless near-field optical microscopy**
Yohannes Abate, Adam Schwartzberg, Daniel Strasser and Stephen Leone
Chem. Phys. Lett. 474,146 (2009)

22. **Spectroscopy and Chemical Dynamics of Group II-Metal Ion-Formaldehyde Complexes**
Paul Kleiber, Wenyn Lu, **Yohannes Abate**
Int'l J. Mass Spec., 269, 1 (2008).
*(**invited review article**)*

23. **Photodissociation Spectroscopy and Dynamics of Mg^+ -Acetic Acid Complex**
Yohannes Abate and Paul Kleiber
J. Chem. Phys. 125, 184310 (2006)

24. **Photodissociation Spectroscopy of Zn+(H_2O) and Zn^+(D_2O)**
Yohannes Abate and Paul Kleiber
J. Chem. Phys. 122, 084305 (2005)

25. **Photodissociation Spectroscopy of Zn^+-Formaldehyde**
Wenyun Lu, **Yohannes Abate**, TH. Wong and Paul Kleiber
J. Phys. Chem. A.108, 10661 (2004)

26. **Optimization and enhancement of H^- ions in a magnetized sheet plasma**
Yohannes Abate and Henry Ramos
Rev. Sci. Instrum. 71, 3689 (2000)

In Preparation

- Yohannes Abate and Akinwande Deji "Black Phosphorus Matters: Progress and Perspective on Surface Properties, Stability and Passivation"
(To be submitted 2017)

Other Publications

- Ogawa, Y.; Nakajima, D.; Minami, F.; Abate, Yohannes; Leone, Stephen R.,

"Nanometer-scale Mapping of Dielectric Constant of Ge/Si Quantum Dots by Using Apertureless Near-field Scanning Optical Microscopy",
AIP Conference Proceedings Vol. 1399 Issue 1, p557. (PHYSICS OF SEMICONDUCTORS: 30th International Conference on the Physics of Semiconductors)

- Y. Abate, M. Arciaga and H. Ramos, "Density measurements of negative hydrogen ions using mass spectrometer",
Science Diliman 13 (2) (2001) 33.

- Y. Abate and H. Ramos, "Optimization and enhancement of H- ion production in magnetized sheet plasma source",
Abstracts of the Regional Meeting on Plasma Research in the 21st Century, Bangkok, May 7-12, 2000, p.12.

- Y. Abate, M. Arciaga and H.J. Ramos "Density measurements of negative hydrogen ion using a mass spectrometer",
Proc. 18th SPP Congress, Puerto Princesa, Palawan, Oct. 27-29, 2000.

- Y. Abate, P. Concepcion, R. Awayan, M. Arciaga, M. Macandog, L. Mejia, V. Noguera, M.G. Cardinal and H. Ramos, "Enhanced negative hydrogen ion production in volume ion source",
Proc. 17th SPP Congress, Tacloban City, Leyte, Oct. 22-24, 1999, p.149.

PRESENTATIONS: INVITED AND CONTRIBUTED TALKS

Recent Invited Talks and Presentations

- Invited Talk: Y. Abate "Nanoscopy of Black Phosphorus", MRS (Materials Research Society) Spring Meeting and Exhibit in Phoenix, AZ, USA, April 17 - 21, 2017

- Invited Talk: Y. Abate "Spectroscopy and Imaging of Single Nanoparticles", AVS (American Vacuum Society) 63rd International Symposium & Exhibition in Nashville, TN, USA, November 6 - 11, 2016

- Invited Talk: Y. Abate "Plasmonic infrared antenna near-field interaction and

resonance manipulation using VO_2 thin films", 81st Southeastern Section of the American Physical Society (SESAPS), Invited Speaker, November 2014, University

- Invited Presentation: Y. Abate "Light-Matter Interactions in Nano-structured Materials: Plasmonics, Microscopy and Spectroscopy", Scialog Conference for outstanding PIs organized by Cottrell College Science Awards Program, Tucson, AZ*, October 2013*.

Contributed Talks/Presentations and Colloquia

- Y. Abate "Nanoscopy Reveals Metallic Black Phosphorus", Contributed talk, 14th International Conference on Near-Field Optics (NFO-14), Act City Hamamatsu, Japan, 4-8 September, 2016

- Y. Abate "Infrared nanoscopy of indium-rich InGaN epilayers", Contributed talk, AVS 62nd International Symposium & Exhibition (AVS-62) 18–23 October 2015 San Jose, CA – USA

- Y. Abate "Nanoscale Light-matter Interaction: Probing Plasmons and Correlated Systems", University of Georgia, Athens, Seminar at NanoSEC, April 2015

- Y. Abate "Active Nanoscale Transformation of Infrared Plasmonic Dipole Antennas to Monopole Antennas ", Contributed talk, American Physical Society, March 2015

- SPRING PGSA Conference Talk "Nanoscale Light-matter Interaction: Probing Plasmons and Correlated Systems", April 24, 2015 Georgia State University, Atlanta, GA – Lanier Suite

- Y. Abate "Multiple plasmonic infrared antenna near-field interaction and resonance manipulation using VO_2 thin films Spectroscopy", 13th International Conference on Near-Field Optics (NFO-13), Speaker and Session Chair, University of Utah, Utah, September 2014

- Y. Abate "Novel Physics in Nano-structured Materials: Plasmonics, Microscopy and Spectroscopy", University of North Carolina, Charlotte, Colloquium, February 2014

- Y. Abate “Plasmons/ Photovoltaics”,
  Invited Scialog Conference for outstanding PIs organized by Cottrell College Science Awards Program, Tucson, AZ, *October 2014.*

- Y. Abate “Scattering type Scanning Near-field Optical Microscopy (s-SNOM)”, Plasmonics Seminar, Mechanicl Engineering Dept., UC Berkeley *August 2013.*

- Y. Abate “Novel Physics in Nano-structured Materials: Plasmonics, Microscopy and Spectroscopy”, University of Maryland Baltimore County (UMBC), Colloquium, February 2013

- Y. Abate “Nanoscale Novel Physics in Nano-structured Materials: Plasmonics, Microscopy and Spectroscopy”, Emory University, Colloquium, January 2013

- Y. Abate “Chemical Microscopy and Spectroscopy In a Nanometer Scale”, University of Southern California (USC), Quantum Information and Condensed Matter Physics Seminar, October 2011

- Y. Abate “Subsurface Nano-Imaging and Spectroscopy of Silica and Silica-Gold Composite Nanoparticles Using Tip enhanced Near-Field Microscopy”, CSULB, Third Annual CNSM Faculty Research Symposium, May 2011

- Y. Abate “Nannometer Scale Near-field Microscopy and Spectroscopy”, Colloquium, Andrews University, January 2009

- Y. Abate “Apertureless near-field optical microscopy study of the growth of Silicon Nitride (Si_3N_4) islands on a Si substrate.” American Physical Society, California Section Dominguez Hills, October 2008.

- Y. Abate “Apertureless Near-field Microscopy ”, Max-Planck Institute für Biochemie, Matinsried (Munich), Germany, August 2008.

- Y. Abate, A. Schewertzberg, D. Strasser and S.R. Leone “Apertureless Near-field Optical Microscopy study of capped and uncapped gold naoparticles” 2008 Berkeley Nanotechnology Forum, UC Berkeley, April 2008.

- Y. Abate “Spectroscopy and Dynamics of Metal-Ion Molecular Clusters and the

Prediction and Rationalization of Histidine pKa Values" Meeting for Scholars of African Decent Evans Hall, UC Berkeley, November 2006.

- Y. Abate and P.D. Kleiber "Spectroscopy and Dynamics of Metal-Organic Molecule Clusters That Serve as Gas Phase Models for Biological Functions." 2006 Biophysical Society 50th Annual meeting, Salt Lake City, Utah, February 2006.

- Y. Abate and P.D. Kleiber " Combined Theoretical and Experimental Study of the Spectroscopy and Photochemistry of $MgOCH_4^+$ " 36th Midwest Theoretical Chemistry Conference, poster presentation, Michigan State University, East Lansing, June 2004.

- Y. Abate and H.J. Ramos "Effect of noble gas mixing on H^- production in a magnetized sheet plasma," Regional Conference on Plasma Research in 21st Century, Bangkok, Thailand, May 2000.

- Y. Abate, P. Concepcion, R. Awayan, M. Araiga and HJ Ramos "Enhanced negative hydrogen ion production in volume ion source," 17th National Physics Congress, Leyte, Philippines, October 2000.

- Y. Abate, M. Arciaga, HJ Ramos, "Density measurements of Negative Hydrogen Ions Using Mass Spectrometer," 18th National Physics Congress, Palawan, Philippines, October 1999.

Students Oral and Poster Presentations (Since Moving to GSU)

- (Contributed Talk) S. Gamage "Nanoscopy of black phosphorus", APS (American Physical Society) March Meeting in Baltimore, MD, USA, March 14 - 18, 2016
- (Contributed Talk) S. Gamage "Nanoscopy of black phosphorus", PGSA (Physics Graduate Student Association) at Georgia State University Fall conference in Atlanta, GA, USA, November 18, 2016
- (Contributed Talk) M. Howard "Spectroscopy and Imaging of Single Virus Particles", PGSA (Physics Graduate Student Association) Fall Conference at Georgia State University in Atlanta, GA, USA, November 18, 2016
- M. Howard "Spectroscopy and Imaging of Single Virus Particles",

Undergraduate STEM (Science ,Technology, Engineering, and Mathmatics), Poster Presentation, Conference at Georgia State University in Atlanta, GA, USA, November 11, 2016

- S. Gamage "Nanoscopy of black phosphorus", Poster Presentation, AVS (American Vacuum Society) 63rd International Symposium & Exhibition in Nashville, TN, USA, November 6 - 11, 2016
- A. Fali "nanoscopy of Phase separation in InGaN Nanostructures", Poster Presentation, AVS (American Vacuum Society) 63rd International Symposium & Exhibition in Nashville, TN, USA, November 6 - 11, 2016
- B. Cross "Spectroscopy and Imaging of Single Viruses", Poster Presentation, AVS (American Vacuum Society) 63rd International Symposium & Exhibition in Nashville, TN, USA, November 6 - 11, 2016
- S. Gamage "Near-field nanoscopy of black phosphorus degradation", Poster Presentation, MRS (Materials Research Society) Fall Meeting & Exhibit in Boston, MA, USA, November 29 – December 04, 2015

Professional Scholarly Activities:

- Program Organizer AVS (American Vacuum Society) 64th International Symposium & Exhibition in Tampa, FL, USA, November, 2017
- Program Organizer AVS (American Vacuum Society) 63rd International Symposium & Exhibition in Nashville, TN, USA, November 6 - 11, 2016
- Session Chairs for MRS Spring 2017, AVS 63 and 64, NFO-13, Southeastern Section of the American Physical Society (SESAPS) November 2014, California Section American Physical Society at Caltech, Oct. 2010
- Proposal Reviewer Panels and Written Reports: NSF Review Panel, CMP April 2010, written reviews CMP 2016, DoD (ARO, AFOSR) proposal reviewer 2015-2016, Research Corporation for Science Advancement, 2016
- Referee for ACS Nano, Optics Express, Optics Communications, Journal of Nanoparticle Research, Journal of Chemical Physics, Chemical Physics Letters, Journal of Physical Chemistry, Journal of Mathematical Physics, Light: Sciences and Applications (Nature Publishing Group), Frontiers of Physics
- Organizing university visits around Atlanta to increase awareness of our department and potential recruit local students. Collected research summaries from most faculty and used information on their websites to include in a PPT presentation for visiting faculty to use.

EXTERNAL FUNDING

On Going

6/1/2016 to 5/30/2021
Source of support: NSF CARRER AWARD
Project/Proposal Title: Nanoscopy of Two-Dimensional Materials
PI: Y. Abate
Co-PI: None
Total award amount: $550, 000.00

8/1/2016 to 7/30/2019
Source of support: DOD/AFOSR
Project/Proposal Title: Probing Nanoscale Fundamental Interactions of Electrons and Quasiparticles From Optical to Terahertz Frequencies"
PI: Y. Abate
Co-PI: None
Total award amount: $420, 000.00

6/2/16 to 5/31/17
Source of support: DOD/ARO-AFOSR
Project/Proposal Title: Equipment Requested: Tunable Narrowband Terahertz Source and Accessories for Near-Field Nano-spectroscopy and Imaging
PI: Y. Abate
Co-PI: None
Total award amount: $387,458.00

1/01/2015 to 12/31/16
Source of support: Scialog Collaborative Innovative Award Research Corporation Cottrell College Science Award.
Project/Proposal Title: Emerging Au-VO_2 nanocomposites as a potentially switchable CO_2 catalyst
PI: Y. Abate, Georgia State University
Min Ouyong, University of Maryland, College Park
David Cliffel, Vanderbilt University
Total award amount: $100,000.00

1/1/2016 to 12/30/2019
Source of support: DOE
Project/Proposal Title: Development of Ga-rich group III-Nitride based Avalanche Photodiodes"
PI: N. Dietz (GSU), co-PI: Y. Abate (GSU)
Total award amount: $1.42M

Pending

9/1/17 to 8/30/22
Source of support: NIH
Project/Proposal Title: Nano-Imaging and Spectroscopy of Single Enveloped Virus-Cell Fusion
PI: Y. Abate (Physics)
co-PI: M. Luo (Chemistry)
Total award amount: $1.9 M

1/1/17 to 12/31/19
Source of support: DOE
Project/Proposal Title: Collaborative Research With Emory University: Ultrafast hot-electron processes in metal-semiconductor nanostructures
PI: H. Harutyunyan (Emory Physics)
co-PIs: Y. Abate and M. Stockman (GSU Physics)
Total award amount: $604,174.00

MENTORING EXPERIENCE

Undergraduate/Graduate/Postdoctoral Students Supervised

Former Students

Name	Level	Date of graduation	Thesis/Project	Current address
Sarah Grefe	Graduate (MS)	2013	Topological insulator and metamaterial near-field imaging	PhD program Rice University, with P. Nordlander.
Stefan Mastel	Graduate (MS)	2013	Infrared nanoscale antenna interactions	PhD program Nano Gune (Spain), with R. Hillenbrand
Ralph Damato	Graduate (MS)	2013	Polarization control of localized surface plasmons	Medical Physicist Kaiser Permanente (imaging Physicist)
Zachary Nuno	Graduate (MS)	2011	Visible and mid IR near-field spectroscopy of plasmons and phonon resonant nanoparticles	PhD program (UC Merced)
Bryan Heiberg	Graduate (MS)	2010	Fundamental near-filed probe sample interactions	College Teacher, LA

Roxana Chavarria	Undergra duate	Summer 2012	FDTD simulations of metamaterials	PhD program UCLA
Rosie Chhun	Undergra duate	Fall 2011	Sample preparation	University of Washington, Pharmacy program
Kenneth Zia	Undergra duate	Summer 2010	Interferometry	University of Arizona
Tim Buoye	Undergra duate	Fall 2011	Near-field microscopy	Family business
Jill Pestana	Undergra duate	Current	Phase transition	PhD program UC Irvine
Kenneth Zia	Undergra duate	Summer 2010	Interferometry	University of Arizona
Tim Buoye	Undergra duate	Fall 2011	Near-field microscopy	Family business
Jerry J Ochoa	Undergra duate	Fall 2012	Sample preparation/x-webmaster	Unknown
Codi Bonney	Undergra duate	Spring 2012	Near-filed microscopy	iOS Software Developer
Brandon Jacob Hessler	Undergra duate	Current	Sample preparation	? Company

Current Students at GSU				
Colin Lewis	Undergrad	Current	2D layered materials	
Marquez Howard	Undergrad	Current	Viruses/cells	
Sampath Gamage	Graduate	Current	2D layered materials	
Brendan Cross	Graduate	Current	Viruses/cells	
Alireza Fali	Graduate	Current	InGaN nanolayers	
Neda Aghamiri	Graduate	Current	2D materials	

Durai Murugan	Post Doc	Current	THz-Vis s-SNOM, 2D materials	

TEACHING EXPERIENCE:

Courses Taught at GSU:

- *Physics 2211K (Principles of Physics I), Fall 2014.* The course concentrates on mechanics, heat and wave motion. The class size was 55 students. The course serves as the introductory calculus based physics course for majors and non-majors. Duties include preparing and delivering lectures, grading examinations/quizzes, holding office hours.
- *Physics 2212 (Principles of Physics II), Spring 2015, Fall 2015, Spring 2017 (Current).* The course concentrates on Waves, Optics, Electricity and Magnetism. The class size was 45 students. The course serves as the introductory calculus based physics course for majors and non-majors. Duties include preparing and delivering lectures, grading examinations/quizzes, holding office hours.
- *Physics 8110 (Classical Electrodynamics II), Spring 2016.* The course concentrates on Maxwell Equations, Macroscopic Electromagnetism, Conservation Laws, Plane Electromagnetic Waves and Wave Propagation Wave Guides, Resonant Cavities, and Optical Fibers, Radiating Systems, Multipole Fields and Radiation, Special Theory of Relativity and Dynamics of Relativistic Particles and Fields. The class size is 12students. This is a graduate level core course. Duties include preparing and delivering lectures, grading examinations/quizzes, holding office hours.
- *Phys 8710 Nanospectrocopy-, Spring 2017 (current).* This is a new course designed for advanced graduate students as part of NSF CAREER Award. The following topics will be included in this course: (i) theoretical foundations, (ii) optical properties of quantum wells, (iii) heterostructures, (iv) nano-optical microscopy techniques based on elastic and inelastic light scattering which include resonant Rayleigh scattering, interference techniques, resonant Raman scattering and photo luminescence, (v) near-field optics; and (vi) selected topics from books, such as the "The Physics of Low-dimensional Semiconductors" by John H. Davies, the "Principles of Nano-optics" by L. Novotny and B. Hecht and from some recent journal/review articles will be considered.
- *Phys 1000 Gateway to Physics- Spring 2017 (current).* This is a seminar course intended to introduce physics broadly and the various resources and research topics. No background in physics is necessary. It is required for physics majors.
- *Phys 8710* Research topics in physics- *Spring/Fall of 2015, 2016, Spring 2017 (current)*
- *Phys 8910* directed study in physics – *Spring/Fall of 2015, 2016, Spring 2017 (current)*

- *Phys 9999* doctoral dissertation research – *Spring/Fall of 2015, 2016, Spring 2017 (current)*

Courses Taught at CSULB:

(Lab manuals and Course notes I wrote are available upon request)

Physics 576 (Graduate Modern Optics), Lecture and Lab, Fall 2012. I developed both the lecture and lab of this course. I designed the lab and wrote a manual. The course is focused on the fundamentals of optical properties of solids. Specifically on light matter interactions on nanostructured materials. The lecture and the laboratory were structured to complement each other in introducing students to modern research techniques and topics in modern optics.

Physics 476 (Undergraduate Modern Optics), Lecture and Lab, Fall 2012. I developed this course, designed the labs and wrote a lab manual. This undergraduate course in modern optics is focused on fundamentals of optical properties of solids beginning with geometrical optics.

Physics 380 (Modern Electronics, Lecture and Lab), Spring 2013, 2012, 2011, 2010. I developed this course, wrote the lab manual. The goal of this course is to train science students, both undergraduate and graduate, to build small practical circuits. develop laboratory skills, and perform electronic measurements.

*Phys 450 (Quantum Mechanics I), Fall 2011.*The goal of the course is to cover the experimental basis of quantum physics, introduce wave mechanics, Schrodinger's equation in a single dimension, and Schrodinger's equation in three dimensions. I designed the class to be interactive. As part of implementation of Peer Instruction, I used web sources extensively such as The ComPADRE Digital Library (http://www.compadre.org/), and other networks of free online resource collections.

Phys 100 A (General Physics). Lecture and Lab, Fall 2009, 2010 and 2011, 2013(current). This is a large class (80-150 students) that serves as the introductory physics course for non-majors. Duties include preparing lectures, grading exams and quizzes. I implement iclickers and in class demonstrations.

Other small class size courses-Physics 697 (Directed Research), Physics 698 (Thesis), and Physics 496 (Special Problems).

Teaching Experience before Joining CSULB

Teaching Assistant (TA): June 2001-May 2006 (The University of Iowa). I was a TA for the

graduate courses (Quantum Mechanics, Classical Electrodynamics, Statistical Physics) and Advanced and Introductory undergraduate courses (Introduction to Astronomy, Electrostatics, Maxwell's equations, and Geometrical Optics). TA duties included conducting laboratory lectures, holding office hours, grading assignments and final exams.

Instructor 7 of Physics: From June 2000 to April 2001, I taught physics at the level of Instructor 7 at the National Institute of Physics, University of the Philippines, Diliman, Quezon City Philippines. Courses taught include undergraduate physics courses-Thermal Physics, Relativity, Quantum Mechanics, Electricity and Magnetism, Wave Phenomena, and Optics. Instructor duties included full responsibility of lecture and laboratory classes.

Instructor 1 of Physics: From November 1997 to May 2000, I taught physics at the level of Instructor 1 at the National Institute of Physics, University of the Philippines, Diliman, Quezon City Philippines. Courses taught include Elementary Physics - Electricity and Magnetism, Wave Phenomena, and Optics and Elementary Physics - Mechanics of Particles, Rigid Bodies, and Fluids. Instructor duties included lecture and laboratory supervision.

Instructor of Physics: Between July 1,1995-May 1997 I taught college physics at the Ethiopian Adventist College of Science Shashamane, Ethiopia.

Student Work Direction:

1. Dissertations (or doctoral thesis): 4
2. Membership on committees, such as exam/program committees, for individual student work:

- thesis committee member for: Bojun Zhang and Kasuni Nanayakkara, advisor Dr. Kozhanov
- thesis committee member for: Ganesh Chand, advisor Dr. Dhamala
- thesis committee member for: Tianyu Ye, advisor Dr. Mani
- thesis committee member for: Mark Vernon, advisor Dr. Dietz

GSU-Related Seminars/Presentations:

- SPRING PGSA Conference Talk "Nanoscale Light-matter Interaction: Probing Plasmons and Correlated Systems", April 24, Georgia State University, Atlanta, GA – Lanier Suite Guest Lectures:
  - Guest speaker for PHYS1000. Met with new physics students and told them about my research work and my interest related to physics and gave a lab tour.
  - Short Research Presentation Phys3300, Advanced Physics Lab (taught by Dr. Thoms)

- Organizer and speaker on research topics for new graduate students

UNIVERSITY SERVICE/SYNERGISTIC ACTIVITIES

- Search Committee member for the Center for Nano-Optics (CeNO), Fall 2015-Spring 2016
- By Laws Committee member Fall 2015-present
- Colloquium Committee 2016-present. Invited and hosted several speakers
- Space, Planning, and Development Committee member Fall 2015-present
- Organizer Research Summary Presentations, Fall 2015, Nelson Lecture Fall 2015
- Chair and organizer of the Physics Demonstration Committee in charge of developing and sustaining physics demonstrations for the general and upper division classes. Built a website, purchased several demos through departmental support and influenced the use of demos for interactive teaching in the classrooms.
- Co-organized campus talks through Louis Stokes Alliance for Minority Participation program targeted to help minority students in the requirements, procedures and choice of graduate school. Gave summer talks organized by The Upward Bound Math and Science program for high school students on physics in general and success as a person of color. Participated in summer program designed to create familiarity and friendship for academic success for incoming minority students organized by The Mathematics, Engineering, and Science, Achievement program.
- Editorial board member of the Editorial Board member of The Journal of Modern Physics, August 2012
- Judge in student research competition, CSULB Feb 2010
- Membership in university, college and department level faculty committees at CSULB: University Senator Spring 2012, College Council (since Spring 2012), Department Council. *non-tenured Representative,* Department Curriculum Committee, Grade Appeals Committee (Chair)*,* The Committee on Lecture Demonstrations (Chair) Fall 2010-present*,* Graduate Committee*,* Election Committee

Membership in Professional Societies

- Ethiopian Physical Society, North America (EPS-NA)
- Materials Research Society (MRS)
- American Vacuum Society (AVS)
- American Physical Society (APS)

CURRICULUM VITAE

Name: Vadym Apalkov
Rank: Professor
Department: Physics and Astronomy

(a) Education

- *PhD*, University of Utah, Salt Lake City, UT, U.S.A., 1995
- *Candidate of Physical and Mathematical Sciences*, Landau Institute of Theoretical Physics, Moscow, Russia, 1992.
- *Master of Science*, Department of General and Applied Physics, Moscow Institute of Physics and Technology, Russia, 1991

(b) Professional Credentials

Professor: August 2015 – now
Georgia State University, Atlanta, GA

Associate Professor: August 2010 – July 2015
Georgia State University, Atlanta, GA

Assistant Professor: August 2004 – 2010
Georgia State University, Atlanta, GA

Assistant Research Professor July 2003 – August 2004
University of Utah, Salt Lake City, UT, U.S.A.

Postdoctoral Research Associate August 2001 – July 2003
University of Utah, Salt Lake City, UT, U.S.A.

Visiting Research Scientist June 2001 – July 2001
Max Plank Institute for the Physics of Complex Systems, Dresden, Germany

Postdoctoral Research Associate February 2001 – July 2001
University of Exeter, Exeter, UK

Research Scientist September 2000 – January 2001
Kharkov Institute of Physics and Technology, Kharkov, Ukraine

Visiting Research Scientist June 2000 – September 2000
Max Plank Institute for the Physics of Complex Systems, Dresden, Germany

Postdoctoral Research Associate 1999 - 2000
Institute of Mathematical Sciences, Madras, India

Research Scientist 1996 – 1999
Kharkov Institute of Physics and Technology, Kharkov, Ukraine

Research Scientist 1992 – 1996
Landau Institute for Theoretical Physics, Moscow, Russia

(c) Scholarship and Professional Development

Publications – Referred Journal Articles

2016

[126] Hamed Koochaki Kelardeh, Vadym Apalkov, and Mark I. Stockman, "*Buckled graphene-like materials in ultrashort and strong optical fields*", Proc. SPIE 9746, **Ultrafast Phenomena and Nanophotonics**, 97460I (2016).
[125] Hamed Koochaki Kelardeh, Vadym Apalkov, and Mark I. Stockman, "*Graphene under a few-cycle circularly polarized optical field: ultrafast interferometry and Berry phase manifestation*", **Carbon Nanotubes, Graphene,** and Emerging 2D Materials for Electronic and Photonic Devices, 99320E (2016).
[124] O. Kwon, V. Apalkov, M. Stockman, and D. Kim, "*Universality of optical-field-induced semimetallization in dielectrics*," in *Frontiers in Optics 2016*, **OSA Technical Digest**, JTh2A,103 (2016).
[123] TM Herath, V Apalkov, "*Energy spectra and optical transitions in germanene quantum dots*", **Journal of Physics: Condensed Matter 28** (16), 165301 (2016).
[122] Hamed Koochaki Kelardeh, Vadym Apalkov, and Mark I. Stockman, "*Attosecond strong-field interferometry in graphene: Chirality, singularity, and Berry phase*", **Phys. Rev. B 93**, 155434 (2016).
[121] Hari P. Paudel, Vadym Apalkov, and Mark I. Stockman, "*Three-dimensional topological insulator based nanospaser*", **Phys. Rev. B 93**, 155105 (2016).
[120] Ojoon Kwon, Tim Paasch-Colberg, Vadym Apalkov, Bum-Kyu Kim, Ju-Jin Kim, Mark I. Stockman, D. Kim, "*Semimetallization of dielectrics in strong optical fields*", **Scientific Reports 6,** 21272 (2016).
[119] Hamed Koochaki Kelardeh, Vadym Apalkov, and Mark I. Stockman, "*Buckled Dirac Materials in Ultrashort and Strong Optical Field: Coherent Control and Reversibility Modulation*", **IEEE Transactions on Nanotechnology**, **15**, 51 (2016).

2015

[118] Hamed Koochaki Kelardeh, Vadym Apalkov, and Mark Stockman, "*Ultrafast field control of symmetry, reciprocity, and reversibility in buckled graphene-like materials*", **Phys. Rev. B 92**, 045413 (2015).
[117] Vadym Apalkov, and Mark Stockman, "*Theory of Solids in Strong Ultrashort Laser Fields*", **Attosecond Nanophysics: From Basic Science to Applications**, 197-234 (2015).
[116] V. Apalkov and T. Chakraborty, *" Fractal butterflies in buckled graphenelike materials*", **Phys. Rev. B 91**, 235447 (2015).
[115] Hamed Koochaki Kelardeh, Vadym Apalkov, and Mark Stockman, "*Graphene in ultrafast and superstrong laser fields*", **Phys. Rev. B 91**, 045439 (2015).
[114] V. Apalkov and T. Chakraborty, *" Fractal butterflies of Dirac fermions in monolayer and bilayer graphene*", **IET Circuits, Devices & Systems 9 (1)**, 19-29 (2015).

2014

[113] Hamed Koochaki Kelardeh, Vadym Apalkov, and Mark Stockman, "*Wannier-Stark states of graphene in strong electric field* ", **Phys. Rev. B 90**, 085313 (2014).
[112] V. Apalkov and T. Chakraborty, *"Tunability of the fractional quantum Hall states in buckled Dirac materials*", **Phys. Rev. B 90**, 245108 (2014).
[111] V. Apalkov and M. Stockman, *"Proposed graphene nanospaser*", **Light Sci Appl. 3**, 191 (2014).
[110] V. Apalkov and T. Chakraborty, " *Gap Structure of the Hofstadter System of Interacting Dirac Fermions in Graphene*", **Phys. Rev. Lett. 112**, 176401 (2014).
[109] TM Herath, P Hewageegana, V Apalkov, "*A quantum dot in topological insulator nanofilm*", **Journal of Physics: Condensed Matter 26**, 115302 (2014).
[108] V. R. Chaganti and V. Apalkov, "*Theoretical study of intraband optical transitions in conduction band of dot-in-a-well system*", **AIP Advances 4**, 027125 (2014).
[107]] A. Schiffrin, T. Paasch-Colberg, N. Karpowicz, V. Apalkov, D. Gerster, S. Mühlbrandt, M. Korbman, J. Reichert, M. Schultze, S. Holzner, J. V Barth, R. Kienberger, R. Ernstorfer, V. S Yakovlev, M. I Stockman, F. Krausz, *"Addendum: Optical-field-induced current in dielectrics",* **Nature 507**, 386-387 (2014).

[106] T. Paasch-Colberg, A. Schiffrin, N. Karpowicz, S. Kruchinin, Ö. Sağlam, S. Keiber, O. Razskazovskaya, S. Mühlbrandt, A. Alnaser, M. Kübel, V. Apalkov, D. Gerster, J. Reichert, T. Wittmann, J. V. Barth, M. I. Stockman, R. Ernstorfer, V. S. Yakovlev, R. Kienberger, and F. Krausz, "*Solid-state light-phase detector*", **Nature Photonics**, **8**, 214 (2014).

2013

[105] Vadym Apalkov and Mark I. Stockman, "*Metal nanofilm in strong ultrafast optical fields*", **Phys. Rev. B 88**, 245438 (2013).
[104] T. Chakraborty and V. Apalkov, "Aspects of the fractional quantum Hall effect in graphene", *Physics of Graphene*, H. Aoki & M. Dresselhaus (Eds.), (Springer, 2013) **(Book Chapter)**
[103] V. Apalkov and T. Chakraborty, "*Incompressible States of Dirac Fermions in Graphene with Anisotropic Interactions*", **Solid State Comm. 177**, 128 (2013).
[102] T. Chakraborty and V. Apalkov, "*Traits and characteristics of interacting Dirac fermions in monolayer and bilayer graphene*", **Solid State Comm. 175**, 123 (2013) (invited article).
[101] T.M. Herath, P. Hewageegana, V. Apalkov, "*Electron scattering by a steplike defect in topological insulator nanofilms*", **Physical Review B 87** (7), 075318 (2013).
[100] V.R Chaganti, V. Apalkov, "*Intraband optical transition in InGaAs/GaAs pyramidal quantum dots*", **Journal of Applied Physics 113** (6), 064310 (2013).
[99] A. Schiffrin, T. Paasch-Colberg, N. Karpowicz, V. Apalkov, D. Gerster, S. Mühlbrandt, M. Korbman, J. Reichert, M. Schultze, S. Holzner, J. V Barth, R. Kienberger, R. Ernstorfer, V. S Yakovlev, M. I Stockman, F. Krausz, "*Optical-field-induced current in dielectrics*", **Nature 493** (7430), 70 (2013).
[98] M. Schultze, E. M Bothschafter, A. Sommer, S. Holzner, W. Schweinberger, M. Fiess, M. Hofstetter, R. Kienberger, V. Apalkov, V. S Yakovlev, M. I Stockman, F. Krausz, "*Controlling dielectrics with the electric field of light*", **Nature 493** (7430), 75 (2013).

2012

[97] V. Apalkov and T. Chakraborty, "*The Fractional Quantum Hall Effect of Tachyons in a Topological Insulator Junction*", **EPL (Europhys. Lett.)** 100, 67008 (2012).
[96] V. Apalkov and T. Chakraborty, "*Superluminal Tachyon-like Excitations of Dirac Fermions in a Topological Insulator Junction*", **EPL (Europhys. Lett.)** 100, 17002 (2012).
[95] V. Apalkov and T. Chakraborty, "*Electrically tunable charge and spin transitions between Landau levels of interacting Dirac fermions in trilayer graphene*", **Phys. Rev. B** 86, 035401 (2012).
[94] V. Apalkov and T. Chakraborty, "*Comment on `Fock-Darwin states of Dirac electrons in graphene-based artificial atoms*'", **Phys. Rev. Lett** 108, 169702 (2012).
[93] Vadym Apalkov and Mark I. Stockman, "*Theory of dielectric nanofilms in strong ultrafast optical fields*", **Phys. Rev. B** 86, 165118 (2012).

2011

[92] V. Apalkov and T. Chakraborty, "*Stable Pfaffian state in bilayer graphene*", **Phys. Rev. Lett.** 107, 186803 (2011).
[91] V. Apalkov and T. Chakraborty, "*Interacting Dirac fermions on a topological insulator in a magnetic field*", **Phys. Rev. Lett.** 107, 186801 (2011).
[90] V. Apalkov and T. Chakraborty, "*Optical transitions at commensurate angles in a misoriented bilayer graphene in an external magnetic field*", **Phys. Rev. B**. **84**, 033408 (2011).
[89] V. Apalkov and T. Chakraborty, "*Electronic Raman signatures of valley polarization, shell filling in graphene quantum dots*", **EPL (Europhys. Lett.) 95**, 17008 (2011).

2010

[88] V. Apalkov and T. Chakraborty, "*Controllable, driven phase transitions in the fractional quantum Hall states in bilayer graphene*", **Phys. Rev. Lett., 105,** 036801 (2010).
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[84] V. Apalkov, G. Ariyawansa, A. G. U. Perera, M. Buchanan, Z. R. Wasilewski, and H. C. Liu, "*Polarization Sensitivity of Quantum Well Infrared Photodetector Coupled to a Metallic Diffraction Grid"*, **IEEE Journal of Quantum Electronics, 46,** 877 - 883 (2010).

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2009

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2008

[80] D. S. L. Abergel, V. M. Apalkov, and Tapash Chakraborty, "*Interplay between valley polarization and electron-electron interaction in a graphene ring*", **Physical Review B 78**, 193405 (2008)

[79] V.M. Apalkov and T. Chakraborty, "*Influence of correlated electrons on the paramagnetism of DNA*", **Physical Review B 78,** 104424 (2008).

[78] P. Hewageegana and V. Apalkov, "*Theoretical study of terahertz quantum well photodetectors: Effect of metallic diffraction coating*", **Infrared Physics & Technology, 51,** 550 (2008).

[77] P. Hewageegana and V. Apalkov, "*Enhanced mid-infrared transmission through metallic diffraction grating*", **J. Phys.:Condens. Matter 20,** 395228 (2008).

[76] P. Hewageegana and V. Apalkov, "*Electron localization in graphene quantum dots*", **Physical Review B, 77** 245426 (2008).

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[71] V. Apalkov, "*Magnetic field tunability of quantum dot infrared photodetectors***", *J. Phys.: Condens. Matter* 20,** 095203 (2008).

[70] G. Ariyawansa, V. Apalkov, A. G. U. Perera, S. G. Matsik, G. Huang, and P. Bhattacharya, "*Bias-selectable tricolor tunneling quantum dot infrared photodetector for atmospheric windows",* **Appl. Phys. Lett. 92**, 111104 (2008).

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2007

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negative differential conductance", **Phys. Rev. B 75**, 045337 (2007)

2006

[60] Apalkov V. M. and Chakraborty T., "*Fractional Quantum Hall States of Dirac Electrons in Graphene*", **Phys. Rev. Lett. 97**, 126801 (2006)

[59] M. Cook and V. Apalkov, "*Strong nonlinear intensity dependence of photocurrent in quantum-dot–quantum-well structures*", **Phys. Rev. B 74**, 193305 (2006)

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[55] Apalkov V. M., Chakraborty T., and Scholler C., "*Spin transitions in an incompressible liquid Coulomb-coupled to a quantum dot*", **Phys. Rev. B 73**, 073310 (2006)

[54] Apalkov V., "*Quantum dot infrared photodetectors: Interdot coupling*", **J. Appl. Phys. 100**, 076101 (2006)

2005

[53] Apalkov V.M., Raikh M.E., and Shapiro B., "*Light intensity correlations in optically active media*", **J. Phys**. **A38** 10545 (2005)

[52] Apalkov V. and Chakraborty T., "*Transverse tunneling current through guanine traps in DNA*", **Phys. Rev. B 72**, 161102 (2005).

[51] Apalkov V.M. and Raikh M.E., "*Effective drag between strongly inhomogeneous layers: Exact results and applications*", **Phys. Rev. B 71**, 245109 (2005).

[50] Apalkov V.M. and Raikh M.E., "*Universal fluctuations of the random lasing threshold in a sample of a finite area*", **Phys. Rev. B 71**, 054203 (2005).

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2004

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[35] TM Herath, P Hewageegana, V. Apalkov, "*Quantum dot in Topological Insulator Nanofilm: energy spectra and optical transitions*", APS March Meeting, Denver, March 2014.

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[29] N. Edirisinghe and V. Apalkov, "*Charge transfer along DNA molecule within Peyrard-Bishop-Holstein model*", APS March Meeting, Portland, Oregon, March 2010.

[28] V. Apalkov and N. Edirisinghe, "*Effect of mismatched base pair on electrical current through homogeneous DNA molecule*", APS March Meeting, Portland, Oregon, March 2010.

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Annual Meeting of the Southeastern Section of the American Physical Society, Atlanta, GA, November, 2009

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[25] P. Hewageegana and V. Apalkov, "*Electron localization in graphene quantum dots*", APS March Meeting, New Orleans, March 2009.

[24] P. Hewageegana and V. Apalkov, "*Enhancement of optical sensitivity of quantum dots near metal-dielectric interface*", APS March Meeting, New Orleans, March 2008.
[23] N. Edirisinghe, V. Apalkov, and G. Cymbalyuk, "*Anomalous Effect of Surface Diffusion on NMR Signal in Restricted Geometry*", APS March Meeting, New Orleans, March 2008.

[22] V. Apalkov, N. Edirisinghe, and Gennady Cymbalyuk, "*Anomalous Effect of Surface Diffusion on NMR Signal: Tracing the Fiber Geometry*", APS March Meeting, New Orleans, March 2008.

[21] V. M. Apalkov, "*Magnetic field effects in quantum cascade structures*", Colloquium, Institute of Physics and Technology, Kharkiv, Ukraine, July, 2006.

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[19] Apalkov V.M., Raikh M.E., and Shapiro B., "*Light Intensity correlations in optically active media*", Workshop: Aspects of quantum chaotic scattering, Dresden, Germany, 2005.

[18] V. M. Apalkov, "*DNA modeling*", Colloquium, University of Manitoba, June, 2005.
[17] V. M. Apalkov, "*Localization of Light*", Colloquium, Institute of Physics and Technology, Kharkiv, Ukraine, 27, July, 2005.
[16] Apalkov V.M., Raikh M.E., "*Effective drag between strongly inhomogeneous layers: exact results*", APS March Meeting, 2005.
[15] Apalkov V.M., Raikh M.E., "*Strong Localization of a Photon at the Intersection of the Phase Slips in 2D Photonic Crystal*", Workshop "Cooperative Phenomena in Optics and Transport in Nanostructures", Max Plank Institute for the Physics of Complex Systems, Dresden, Germany, June 2004.
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[11] Apalkov V.M., Raikh M.E., and Shapiro B., "*Random Lasing and Random Resonators in Disordered Dielectric Films*", Sixth International Conference on Electrical Transport and Optical Properties of Inhomogeneous Media, Snowbird, Utah, July 2002.
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[9] Portnoi M.E. and Apalkov V.M., "*Phonon-assisted recombination of intra-subband magneto-excitons in semiconductor quantum wells".* Optical Properties of 2D Systems with Interacting Electrons, NATO Advance Research Workshop, St. Petersburg, Russia, June 2002.
[8] Raikh M.E. and Apalkov V.M., "*Manifestation of Zero-Field Spin Splitting of 2D Electrons in a Zero-Bias Tunneling Anomaly*". APS March Meeting, Indianapolis, March 2002.
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[5] Portnoi M.E. and Apalkov V.M., "*Phonon-assisted luminescence of magnetoexcitons in semiconductor quantum wells".* The 7th international conference on optics and Excitons in confined systems, Montpellier, France, 2001.
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pipeline", The proceeding of the International Scientific and Technical Conference "The modern devices, materials and technology for technical diagnostics of industrial equipment...", Ukraine, Kharkov, 1998.
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Editorial/Reviewer Projects

Referee for**:** Physical Review B, Physical Review Letter, Physical Review E, Physica E, Physica A, Journal of Physics: Condensed Matter, Journal of Physics D: Applied Physics, Journal of Optical Society of America B, Nanotechnology, Semiconductor Science and Technology,

Grants and External Funding

9. DOE Grant DE-FG02-11ER46789, "*Quantum Nanoplasmonics Theory*", PI: Mark I. Stockman, $429,000, 01/09/2012-09/2015, Senior Personnel: V. Apalkov

8. DOE Grant DE-FG02-01ER15213, "*Novel Nanoplasmonic Theory*", PI: Mark I. Stockman, $300,000, 11/01/2013-10/31/2016, Senior Personnel: V. Apalkov

7. US Department of Defense (Navy) MURI Grant N00014-13-1-0649, "*Novel Nonlinear Optical Processes in Active, Random and Nanostructured Systems",* PI: Mark Stockman (Georgia State University), team universities: Georgia State University, Purdue University, University of Central Florida, University of California at Berkeley, Yale University, and Cornell University. 09/2013-09/2016, GSU amount is $1,370,010**,** Senior Personnel: V. Apalkov.

6. NSF ECCS 1308473, "*Nanoscale solids in strong ultrashort optical pulse*", PI: V. Apalkov, 08/01/2013-07/31/2016, $316,488.

5. Subcontract with NPD Optronics LLC, "*Dualband Polarization Sensitive Quantum Dot Detectors*", PI: V. Apalkov, 12/05/2008-12/04/2009, $111,129.

4. The Petroleum Research Fund, "*Strong Localization of Light in Photonic Crystals Without Bandgap*", PI: V. Apalkov, 9/1/2005-8/31/2007, $35,000.

3. GSU Brain and Behavior Program, Seed Grant "*Modeling and Simulation for Noninvasive Brain Imaging Using Near Infrared Light*", co-Pi: V. Apalkov, 01/01/007-12/31/07, $29,908.

2. GSU Brain and Behavior Program, Seed Grant "*Animatlab: Software for neuro biomechanic simulation*", co-Pi: V. Apalkov, 01/01/007-12/31/07, $29,660.

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Honors, Awards, and Recognition

1998 - *ISSEP Personal Grant YSU082002 for Young Scientists*
1992 - *The Personal Grant of Soros Foundation*
1991 - *The Personal Grant of American Physical Society*
1991 - *Diploma Cum Laude, Moscow Institute of Physics and Technology, Moscow, Russia*

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Teaching Experience

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Courses taught 2004-2015:

Introduction to Physics I, Physics 1111K
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Principles of Physics II, Physics 2212K
Advanced Classical Mechanics, Phys 8010
Statistical Mechanics, Phys 8310
Classical Mechanics, Phys 4600/7600
Statistical and Thermal Physics, Phys 3850
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(e) Service

- **Member** of computing committee (department level) (2013-2015)

- **Member** of 5th-year review of lectures committee (college level) (2013, 2014)

- **Member** of 3-year review committee (John Wilson) (2012).

- **Member** of P&T committee (Dr. Sarsour) (2013).

- **Member** of P&T committee (Dr. Dhamala) (2012).

- **Member** of Friendship Christian School Board of Trustees (2013, 2014).

- **Coordinator** of the "Boomilever" competition at the Georgia Science Olympiad Regional Tournament, (2013,2014).

- **Coordinator** of the "Bridge Building" competition at the Georgia Science Olympiad Regional Tournament, (2006,2008,2009,2010,2011,2015).

- **Coordinator** of the "Tower Building" competition at the Georgia Science Olympiad Regional Tournament, (2007,2012).

- **Judge** at The Siemens Competition in Math, Science & Technology (2010)

- **Judge** at Intel International Science and Engineering Fair (2009)

- **Representative** from Department of Physics and Astronomy in a joint Physics/Math group working on a redesign of Physics 2211/2212 and Mathematics 2211/2212 courses (2009).

- **Member** of Brain&Behaviour Faculty Search Committee at Physics Department (2007)

- **Member** of the Condensed Matter Faculty Search Committee (2006).

- **Member** of Biophysics Program Committee.

- Responsible for creation, administration, and evaluation of Physics **PhD qualifying examination** section for:

    - Classical Mechanics (2008,2009,2012,2013,2014,2015)
    - Statistical Mechanics (2008,2009,2010,2011,2012,2013,2014,2015)

- **Referee** for**:** Physical Review B, Physical Review Letter, Physical Review E, Physica E, Physica A, Journal of Physics: Condensed Matter, Journal of Physics D: Applied Physics, Journal of Optical Society of America B, Nanotechnology, Semiconductor Science and Technology, Computer Physics Communications.

- **Referee** for IEEE conference, 2009.

- Participation in **review** of **NSF** proposals (5 proposals) and **Army Research Office** proposal (1)

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- Graduate research on Earth and exoplanet imaging.

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University Paris 7 — *2000 - 2001*

- Undergraduate internship on Microlensing events at College de France.

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Experience

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- Research focused on image reconstruction for optical interferometry, applied to eclipsing & symbiotic binaries, evolved stars (RSGs, AGBs), YSOs, and AGNs.
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Department of Astronomy, University of Michigan — *2009 – 2012*

- Image reconstruction theory: Compressed Sensing and Bayesian Evidence frameworks.
- Image reconstruction software: Imaging on spheroids, Doppler imaging and light curve inversion.
- Imaging CHARA/MIRC data sets: interacting binaries & spotted stars
- Observation of key Young Stellar Objects with CHARA
- Instrumental development on the CHAMP tracker and MIRC-6T for CHARA

Postdoctoral researcher (Advisor: Prof. Chris Haniff)

Cambridge, UK

Cavendish Laboratory, University of Cambridge — *2004-2009*

- Image reconstruction software BSMEM, winner of the Beauty Contests 2004, 2006, 2010.
- Optical and software studies linked to the Magdalena Ridge Observatory Interferometer.
- Image reconstruction for CHARA and VLTI.

Graduate Research Assistant, Advisors: Prof. Jean Gay & Dr. Frederic Cassaing

Châtillon, France

Department of Theoretical and Applied Optics, ONERA — *2001-2005*

- Ph.D. defended: *Conception and test of a cophasing detector for multi-aperture telescope – Application to exoplanet detection and to Earth imaging from space*
- Conception, design and integration (on an optical bench) of a spatial interferometer with real-time nanometric correction of telescope aberrations.
- Development of fringe tracking algorithms for exoplanet detection (ESA/DARWIN).
- Cophasing/coherencing algorithms for a space interferometer (CNES/SOTISE).

Awards

NSF Astronomy Grant, award number 1616483 — *Georgia State University*

Principal Investigator — *Aug. 2016 - PRESENT*

- *Picturing the faces of stars: limb-darkening models vs. interferometer measurements*, $375,955.

NSF Astronomy Grant, award number 1210972 — *Georgia State University*

Principal Investigator — *Aug. 2013 - Jul. 2017*

- *Imaging Planet-Forming Disks and Stellar Surfaces: An Integrated Program of New Observations and Algorithm Development*, $471,029.

Best Software Award, IAU/SPIE Interferometric Imaging Beauty Contest — *SPIE Astronomical Instrumentation*

Developper — *2004, 2006, 2010, 2012, 2014, 2016*

- Software SQUEEZE and BSMEM have been the multiple times winners of this International Astronomical Union contest since it began in 2004.

CNES Graduate Fellowship — *ONERA, France*

Principal Investigator — *2001 - 2004*

- *Imaging Earth from space and exoplanets from the ground with optical intererfometry*, €215,000.

Skills

Programming	Python, C/C++, Fortran, Julia, bash/sh scripting, LUA, LaTeX
Parallel programming	MPI, OpenMP, CUDA, OpenCL
Web	Django with Python, WebGL, HTML5
Languages	English, French (native)

Teaching

ASTR 1010: Solar System Astronomy and ASTR 1020: Stellar & Galactic Astronomy — *Georgia State University*

Undergraduate Class — *Aug. 2013 - PRESENT*

- A two-semester course on astronomy. ASTR 1010 is an introduction to astronomy through the study of the solar system environment, the early history of astronomy, the place of our Earth in the Universe, as well as our closest neighbors (the solar system planets, satellites and minor bodies). ASTR 1020 covers the physical properties of stars, their formation and evolution, as well as our galaxy and others, and the origin and evolution of the Universe

ASTR 8150: Computational Methods of Physics & Astronomy — *Georgia State University*

Graduate Class — *Aug. - Dec. 2015*

- Solving physics and astronomical problems using modern numerical methods, with a practical "hands-on" approach to code-writing. A wide range of subjects are covered including numerical analysis, error analysis, modeling and fitting, time series analysis, optimization, image processing and parallel programming.

Mentoring

Graduate Research Assistant: Ryan Norris — *Georgia State University*

as Ph.D. Adviser — *Since Aug. 2014*

- Imaging Red Supergiants with interferometry.

Graduate Research Assistant: Matt Anderson — *Georgia State University*

as Ph.D. Adviser — *Since Aug. 2014*

- Inverse problems in AGN science (interferometry, reverberation mapping).

Graduate Research Assistant: Eliot Vrijmoet — *Georgia State University*

as Ph.D. Adviser — *Since Aug. 2016*

- Machine Learning for Radio & Optical Interferometry.

Graduate Research Assistant: Arturo Martinez — *Georgia State University*

as Ph.D. Adviser — *Since Aug. 2016*

- Limb- and gravity-darkening: observations meet theories.

Various M.S. & Ph.D. projects

Georgia State University

AS COMMITTEE MEMBER

2013 – PRESENT

- Master's defenses: Olesya I. Sarajlic, Seyyedeh Azar Oliaeimotlagh, Jitto Titus.
- Ph. D. defenses: Dr. Jeremy Jones, Dr. Zhao Guo.
- Ongoing Ph. Ds: Katie Gordon

Undergraduate projects

Various locations

AS SUPERVISOR

2002-2009

- Internships at University of Cambridge: Andra Stroe.
- Internships at ONERA: four undergraduate students (engineer or MS internships) for the ESA/DARWIN and CNES/SOTISE projects.

Outreach

Hard Labor Creek Observatory Nights

Georgia State University

DIRECTOR

Since Aug. 2014

- As the currently serving director, I am attempting to improve the infrastructure and instruments for smoother public nights.

Seminars during Public Nights at Institute of Astronomy

University of Cambridge

MAIN SPEAKER

6 talks between 2005 and 2009

- Public Open Nights at the Institute of Astronomy, Cambridge, UK (attendance: 50-100 amateur astronomers).

Service

Since 2014	**Chair**, Computer Committee	*Department level*
Since 2016	**Member**, Curriculum Committee	*Department level*
Since 2014	**Director**, Hard Labor Creek Observatory	*Department level*
Since 2014	**Executive Member**, CHARA Consortium	*Department level*

Synergistic Activities

Since 2005	**Journal referee**, A&A, Apj, MNRAS, JOSA-A	
2017	**Panel Member**, Astronomy & Astrophysics Postdoctoral Fellowship	*Arlington, VA*
2014, 2015	**Panel member**, NASA Innovative Advanced Concepts program	*Arlington, VA*

Organizing Committees

2016	**SOC Member**, SPIE Astronomical Instrumentation	*Edingburgh, UK*
2012- 2014	**Organizer (2012), co-Organizer (2014), Rapporteur (2012, 2014)**, SPIE Interferometric Imaging Beauty Contest	*Amsterdam, San Diego, Edinburgh*
Jan. 2013	**Organizer of the Radio and Optical Interferometry session**, International BASP Frontiers Workshop 2013	*Villars-sur-Onion, Switzerland*
2012,2013	**Referee**, CHARA Time Allocation Committee	*USA*
Aug. 2012	**Organizer & Chair**, Ann Arbor Workshop on Practical Image Reconstruction	*Ann Arbor, MI*

Invited Presentations

SPIE Astronomical Instrumentation 2016

Edingburgh, UK

INTERFEROMETRIC IMAGING: A REVIEW

Jul. 2016

ESO HIRES 2014: Astronomy at High Angular Resolution – A Cross-disciplinary Approach

Garching, Germany

IMAGING STELLAR SURFACES WITH OPTICAL INTERFEROMETRY

Nov. 2014

International BASP Frontiers Workshop

Villars-Sur-Ollon, Swizerland

5D IMAGE RECONSTRUCTION OF STELLAR SYSTEMS

Jan. 2013

SPIE Astronomical Instrumentation 2012 — *Amsterdam, Netherlands*

The 2012 IAU Image reconstruction Beauty Contest — *Jul. 2012*

The Event Horizon Telescope Meeting — *Tucson, AZ*

Imaging algorithms for Interferometry — *Jan. 2012*

Royal Astronomical Society National Astronomy Meeting — *Glasgow, UK*

Image reconstruction in Optical Interferometry — *Apr. 2010*

Goutelas Workshop on Image Reconstruction — *Goutelas, France*

Image reconstruction methods — *May 2009*

Publications

Gemini Near Infrared Field Spectrograph Observations of the Seyfert 2 Galaxy Mrk 573: In Situ Acceleration of Ionized and Molecular Gas off Fueling Flows
T. C. Fischer, C. Machuca, M. R. Diniz, D. M. Crenshaw, S. B. Kraemer, R. A. Riffel, H. R. Schmitt, F. Baron, T. Storchi-Bergmann, A. N. Straughn, M. Revalski, C. L. Pope
ApJ 834, 30 (Jan. 2017) p. 30. 2017

Image Reconstruction in Optical Interferometry: An Up-to-Date Overview
F. Baron
Astrophysics and Space Science Library, 2016

Interferometric image reconstruction: techniques, results, and future direction
F. Baron
Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, 2016

Architecture design study and technology road map for the Planet Formation Imager (PFI)
J. D. Monnier, M. J. Ireland, S. Kraus, F. Baron, M. Creech-Eakman, R. Dong, A. Isella, A. Merand, E. Michael, S. Minardi, D. Mozurkewich, R. Petrov, S. Rinehart, T. ten Brummelaar, G. Vasisht, E. Wishnow, J. Young, Z. Zhu
Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, 2016

Stellar Atmospheres, Atmospheric Extension, and Fundamental Parameters: Weighing Stars Using the Stellar Mass Index
H. R. Neilson, F. Baron, R. Norris, B. Kloppenborg, J. B. Lester
ApJ 830, 103 (Oct. 2016) p. 103. 2016

No Sun-like dynamo on the active star ζ Andromedae from starspot asymmetry
R. M. Roettenbacher, J. D. Monnier, H. Korhonen, A. N. Aarnio, F. Baron, X. Che, R. O. Harmon, Z. Kővári, S. Kraus, G. H. Schaefer, G. Torres, M. Zhao, T. A. Ten Brummelaar, J. Sturmann, L. Sturmann
Nature 533 (May 2016) pp. 217–220. 2016

Imaging capabilities of the VLTI/MATISSE spectro-interferometric instrument
J. Sanchez-Bermudez, J.-U. Pott, R. van Boekel, T. Henning, F. Baron, A. Matter, B. Lopez, F. Millour, G. Weigelt, K.-H. Hofmann, D. Schertl
Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, 2016

Orbits, Distance, and Stellar Masses of the Massive Triple Star σ Orionis
G. H. Schaefer, C. A. Hummel, D. R. Gies, R. T. Zavala, J. D. Monnier, F. M. Walter, N. H. Turner, F. Baron, T. ten Brummelaar, X. Che, C. D. Farrington, S. Kraus, J. Sturmann, L. Sturmann
AJ 152, 213 (Dec. 2016) p. 213. 2016

VizieR Online Data Catalog: CANDID code for interferometric observations (Gallenne+, 2015)
A. Gallenne, A. Merand, P. Kervella, J. D. Monnier, G. H. Schaefer, F. Baron, J. Breitfelder, J. B. Le Bouquin, R. M. Roettenbacher, W. Gieren, G. Pietrzynski, H. McAlister, T. Ten Brummelaar, J. Sturmann, L. Sturmann, N. Turner, S. Ridgway, S. Kraus
VizieR Online Data Catalog 357 (July 2015). 2015

CANDID: Companion Analysis and Non-Detection in Interferometric Data
A. Gallenne, A. Mérand, P. Kervella, J. D. Monnier, G. H. Schaefer, F. Baron, J. Breitfelder, J. B. Le Bouquin, R. M. Roettenbacher, W. Gieren, G. Pietrzynski, H. McAlister, T. ten Brummelaar, J. Sturmann, L. Sturmann, N. Turner, S. Ridgway, S. Kraus
2015

Robust high-contrast companion detection from interferometric observations. The CANDID algorithm and an application to six binary Cepheids
A. Gallenne, A. Mérand, P. Kervella, J. D. Monnier, G. H. Schaefer, F. Baron, J. Breitfelder, J. B. Le Bouquin, R. M. Roettenbacher, W. Gieren, G. Pietrzyński, H. McAlister, T. ten Brummelaar, J. Sturmann, L. Sturmann, N. Turner, S. Ridgway, S. Kraus
A&A 579, A68 (July 2015) A68. 2015

Interferometry of ε Aurigae: Characterization of the Asymmetric Eclipsing Disk
B. K. Kloppenborg, R. E. Stencel, J. D. Monnier, G. H. Schaefer, F. Baron, C. Tycner, R. T. Zavala, D. Hutter, M. Zhao, X. Che, T. A. ten Brummelaar, C. D. Farrington, R. Parks, H. A. McAlister, J. Sturmann, L. Sturmann, P. J. Sallave-Goldfinger, N. Turner, E. Pedretti, N. Thureau
ApJS 220, 14 (Sept. 2015) p. 14. 2015

Spectral and spatial imaging of the Be+sdO binary φ Persei

D. Mourard, J. D. Monnier, A. Meilland, D. Gies, F. Millour, M. Benisty, X. Che, E. D. Grundstrom, R. Ligi, G. Schaefer, F. Baron, S. Kraus, M. Zhao, E. Pedretti, P. Berio, J. M. Clausse, N. Nardetto, K. Perraut, A. Spang, P. Stee, I. Tallon-Bosc, H. McAlister, T. ten Brummelaar, S. T. Ridgway, J. Sturmann, L. Sturmann, N. Turner, C. Farrington

A&A 577, A51 (May 2015) A51. 2015

Pushing the (Convective) Envelope: Imaging Spotted Stellar Surfaces with Optical Interferometry

R. M. Roettenbacher, J. D. Monnier, X. Che, F. Baron, E. Pedretti, H. H. Korhonen, Z. Kovari, R. O. Harmon, G. W. Henry, H. A. McAlister, T. A. ten Brummelaar

18th Cambridge Workshop on Cool Stars, Stellar Systems, and the Sun, 2015

Detecting the Companions and Ellipsoidal Variations of RS CVn Primaries. II. o Draconis, a Candidate for Recent Low-mass Companion Ingestion

R. M. Roettenbacher, J. D. Monnier, F. C. Fekel, G. W. Henry, H. Korhonen, D. W. Latham, M. W. Muterspaugh, M. H. Williamson, F. Baron, T. A. ten Brummelaar, X. Che, R. O. Harmon, G. H. Schaefer, N. J. Scott, J. Sturmann, L. Sturmann, N. H. Turner

ApJ 809, 159 (Aug. 2015) p. 159. 2015

Detecting the Companions and Ellipsoidal Variations of RS CVn Primaries. I. σ Geminorum

R. M. Roettenbacher, J. D. Monnier, G. W. Henry, F. C. Fekel, M. H. Williamson, D. Pourbaix, D. W. Latham, C. A. Latham, G. Torres, F. Baron, X. Che, S. Kraus, G. H. Schaefer, A. N. Aarnio, H. Korhonen, R. O. Harmon, T. A. ten Brummelaar, J. Sturmann, L. Sturmann, N. H. Turner

ApJ 807, 23 (July 2015) p. 23. 2015

CHARA/MIRC Observations of Two M Supergiants in Perseus OB1: Temperature, Bayesian Modeling, and Compressed Sensing Imaging

F. Baron, J. D. Monnier, L. L. Kiss, H. R. Neilson, M. Zhao, M. Anderson, A. Aarnio, E. Pedretti, N. Thureau, T. A. ten Brummelaar, S. T. Ridgway, H. A. McAlister, J. Sturmann, L. Sturmann, N. Turner

ApJ 785, 46 (Apr. 2014) p. 46. 2014

New Theoretical Frameworks for Interferometric Imaging

F. Baron, J. Monnier, J. Young, D. Buscher

Resolving The Future Of Astronomy With Long-Baseline Interferometry, 2014

SPARCO : a semi-parametric approach for image reconstruction of chromatic objects. Application to young stellar objects

J. Kluska, F. Malbet, J.-P. Berger, F. Baron, B. Lazareff, J.-B. Le Bouquin, J. D. Monnier, F. Soulez, E. Thiébaut

A&A 564, A80 (Apr. 2014) A80. 2014

First images from the PIONIER/VLTI optical interferometry imaging survey of Herbig Ae/Be stars

J. Kluska, F. Malbet, J.-P. Berger, M. Benisty, B. Lazareff, J.-B. Le Bouquin, F. Baron, C. Dominik, A. Isella, A. Juhasz, S. Kraus, R. Lachaume, F. Ménard, R. Millan-Gabet, J. D. Monnier, C. Pinte, W.-F. Thi, E. Thiebaut, G. Zins

Exploring the Formation and Evolution of Planetary Systems, 2014

Imaging Young Stellar Objects with VLTi/PIONIER

J. Kluska, F. Malbet, J.-P. Berger, M. Benisty, B. Lazareff, J.-B. Le Bouquin, F. Baron, C. Dominik, A. Isella, A. Juhasz, S. Kraus, R. Lachaume, F. Ménard, R. Millan-Gabet, J. Monnier, C. Pinte, F. Soulez, M. Tallon, W.-F. Thi, É. Thiébaut, G. Zins

Improving the Performances of Current Optical Interferometers and Future Designs, 2014

Imaging the Supermassive Black Hole Shadow and Jet Base of M87 with the Event Horizon Telescope

R.-S. Lu, A. E. Broderick, F. Baron, J. D. Monnier, V. L. Fish, S. S. Doeleman, V. Pankratius

ApJ 788, 120 (June 2014) p. 120. 2014

The 2014 interferometric imaging beauty contest

J. D. Monnier, J.-P. Berger, J.-B. Le Bouquin, P. G. Tuthill, M. Wittkowski, R. Grellmann, A. Müller, S. Renganswany, C. Hummel, K.-H. Hofmann, D. Schertl, G. Weigelt, J. Young, D. Buscher, J. Sanchez-Bermudez, A. Alberdi, R. Schoedel, R. Köhler, F. Soulez, É. Thiébaut, J. Kluska, F. Malbet, G. Duvert, S. Kraus, B. K. Kloppenborg, F. Baron, W.-J. de Wit, T. Rivinius, A. Merand

Optical and Infrared Interferometry IV, 2014

The expanding fireball of Nova Delphini 2013

G. H. Schaefer, T. T. Brummelaar, D. R. Gies, C. D. Farrington, B. Kloppenborg, O. Chesneau, J. D. Monnier, S. T. Ridgway, N. Scott, I. Tallon-Bosc, H. A. McAlister, T. Boyajian, V. Maestro, D. Mourard, A. Meilland, N. Nardetto, P. Stee, J. Sturmann, N. Vargas, F. Baron, M. Ireland, E. K. Baines, X. Che, J. Jones, N. D. Richardson, R. M. Roettenbacher, L. Sturmann, N. H. Turner, P. Tuthill, G. van Belle, K. von Braun, R. T. Zavala, D. P. K. Banerjee, N. M. Ashok, V. Joshi, J. Becker, P. S. Muirhead

Nature 515 (Nov. 2014) pp. 234–236. 2014

Multiplicity of Galactic Cepheids from long-baseline interferometry. I. CHARA/MIRC detection of the companion of V1334 Cygni

A. Gallenne, J. D. Monnier, A. Mérand, P. Kervella, S. Kraus, G. H. Schaefer, W. Gieren, G. Pietrzyński, L. Szabados, X. Che, F. Baron, E. Pedretti, H. McAlister, T. ten Brummelaar, J. Sturmann, L. Sturmann, N. Turner, C. Farrington, N. Vargas

A&A 552, A21 (Apr. 2013) A21. 2013

First Images from the PIONIER/VLTI optical interferometry imaging survey of Herbig Ae/Be stars

J. Kluska, F. Malbet, J.-P. Berger, M. Benisty, B. Lazareff, J.-B. Le Bouquin, F. Baron, C. Dominik, A. Isella, A. Juhasz, S. Kraus, R. Lachaume, F. Ménard, R. Millan-Gabet, J. Monnier, C. Pinte, W.-F. Thi, E. Thiébaut, G. Zins

Protostars and Planets VI Posters, 2013

The H-band Emitting Region of the Luminous Blue Variable P Cygni: Spectrophotometry and Interferometry of the Wind

N. D. Richardson, G. H. Schaefer, D. R. Gies, O. Chesneau, J. D. Monnier, F. Baron, X. Che, J. R. Parks, R. A. Matson, Y. Touhami, D. P. Clemens, E. J. Aldoretta, N. D. Morrison, T. A. ten Brummelaar, H. A. McAlister, S. Kraus, S. T. Ridgway, J. Sturmann, L. Sturmann, B. Taylor, N. H. Turner, C. D. Farrington, P. J. Goldfinger

ApJ 769, 118 (June 2013) p. 118. 2013

Interferometric radii of bright Kepler stars with the CHARA Array: θ Cygni and 16 Cygni A and B
T. R. White, D. Huber, V. Maestro, T. R. Bedding, M. J. Ireland, F. Baron, T. S. Boyajian, X. Che, J. D. Monnier, B. J. S. Pope, R. M. Roettenbacher, D. Stello, P. G. Tuthill, C. D. Farrington, P. J. Goldfinger, H. A. McAlister, G. H. Schaefer, J. Sturmann, L. Sturmann, T. A. ten Brummelaar, N. H. Turner
MNRAS 433 (Aug. 2013) pp. 1262–1270. 2013

The 2012 interferometric imaging beauty contest
F. Baron, W. D. Cotton, P. R. Lawson, S. T. Ridgway, A. Aarnio, J. D. Monnier, K.-H. Hofmann, D. Schertl, G. Weigelt, E. Thiébaut, F. Soulez, D. Mary, F. Millour, M. Vannier, J. Young, N. M. Elias, H. R. Schmitt, S. Rengaswamy
Optical and Infrared Interferometry III, 2012

Toward 5D image reconstruction for optical interferometry
F. Baron, B. Kloppenborg, J. Monnier
Optical and Infrared Interferometry III, 2012

Imaging the Algol Triple System in the H Band with the CHARA Interferometer
F. Baron, J. D. Monnier, E. Pedretti, M. Zhao, G. Schaefer, R. Parks, X. Che, N. Thureau, T. A. ten Brummelaar, H. A. McAlister, S. T. Ridgway, C. Farrington, J. Sturmann, L. Sturmann, N. Turner
ApJ 752, 20 (June 2012) p. 20. 2012

Imaging the heart of astrophysical objects with optical long-baseline interferometry
J.-P. Berger, F. Malbet, F. Baron, A. Chiavassa, G. Duvert, M. Elitzur, B. Freytag, F. Gueth, S. Hönig, J. Hron, H. Jang-Condell, J.-B. Le Bouquin, J.-L. Monin, J. D. Monnier, G. Perrin, B. Plez, T. Ratzka, S. Renard, S. Stefl, E. Thiébaut, K. R. W. Tristram, T. Verhoelst, S. Wolf, J. Young
A&A Rev. 20, 53 (June 2012) p. 53. 2012

Imaging from the first 6-beam infrared combiner
X. Che, J. D. Monnier, S. Kraus, F. Baron, E. Pedretti, N. Thureau, S. Webster
Optical and Infrared Interferometry III, 2012

Imaging Disk Distortion of Be Binary System δ Scorpii near Periastron
X. Che, J. D. Monnier, C. Tycner, S. Kraus, R. T. Zavala, F. Baron, E. Pedretti, T. ten Brummelaar, H. McAlister, S. T. Ridgway, J. Sturmann, L. Sturmann, N. Turner
ApJ 757, 29 (Sept. 2012) p. 29. 2012

Gas Distribution, Kinematics, and Excitation Structure in the Disks around the Classical Be Stars β Canis Minoris and ζ Tauri
S. Kraus, J. D. Monnier, X. Che, G. Schaefer, Y. Touhami, D. R. Gies, J. P. Aufdenberg, F. Baron, N. Thureau, T. A. ten Brummelaar, H. A. McAlister, N. H. Turner, J. Sturmann, L. Sturmann
ApJ 744, 19 (Jan. 2012) p. 19. 2012

Control interface concepts for CHARA 6-telescope fringe tracking with CHAMP+MIRC
S. Kraus, J. Monnier, F. Baron, X. Che, R. Millan-Gabet, N. Thureau, E. Pedretti
Optical and Infrared Interferometry III, 2012

Tracking faint fringes with the CHARA-Michigan Phasetracker (CHAMP)
J. D. Monnier, F. Baron, M. Anderson, S. Kraus, R. Millan-Gabet, E. Pedretti, X. Che, T. ten Brummelaar, N. Calvet
Optical and Infrared Interferometry III, 2012

Resolving Vega and the Inclination Controversy with CHARA/MIRC
J. D. Monnier, X. Che, M. Zhao, S. Ekström, V. Maestro, J. Aufdenberg, F. Baron, C. Georgy, S. Kraus, H. McAlister, E. Pedretti, S. Ridgway, J. Sturmann, L. Sturmann, T. ten Brummelaar, N. Thureau, N. Turner, P. G. Tuthill
ApJ Letters 761, L3 (Dec. 2012) p. L3. 2012

Five years of imaging at CHARA with MIRC
J. D. Monnier, E. Pedretti, N. Thureau, X. Che, M. Zhao, F. Baron, T. ten Brummelaar
Optical and Infrared Interferometry III, 2012

First Visual Orbit for the Prototypical Colliding-wind Binary WR 140
J. D. Monnier, M. Zhao, E. Pedretti, R. Millan-Gabet, J.-P. Berger, W. Traub, F. P. Schloerb, T. ten Brummelaar, H. McAlister, S. Ridgway, L. Sturmann, J. Sturmann, N. Turner, F. Baron, S. Kraus, A. Tannirkulam, P. M. Williams
ApJ Letters 742, L1 (Nov. 2011) p. L1. 2011

GPU-accelerated image reconstruction for optical and infrared interferometry
F. Baron, B. Kloppenborg
Optical and Infrared Interferometry II, 2010

A novel image reconstruction software for optical/infrared interferometry
F. Baron, J. D. Monnier, B. Kloppenborg
Optical and Infrared Interferometry II, 2010

Magdalena Ridge Observatory Interferometer: advancing to first light and new science
M. J. Creech-Eakman, V. Romero, I. Payne, C. Haniff, D. Buscher, C. Aitken, C. Anderson, E. Bakker, T. Coleman, C. Dahl, A. Farris, S. Jiminez, C. Jurgenson, R. King, D. Klinglesmith, K. McCord, T. McCracken, K. Nyland, A. Olivares, M. Richmond, M. Romero, C. Salcido, J. Sandoval, F. Santoro, J. Seamons, R. Selina, A. Shtromberg, J. Steenson, N. Torres, D. Westpfahl, F. Baron, M. Fisher, E. Seneta, X. Sun, D. Wilson, J. Young
Optical and Infrared Interferometry II, 2010

Infrared images of the transiting disk in the ε Aurigae system
B. Kloppenborg, R. Stencel, J. D. Monnier, G. Schaefer, M. Zhao, F. Baron, H. McAlister, T. ten Brummelaar, X. Che, C. Farrington, E. Pedretti, P. J. Sallave-Goldfinger, J. Sturmann, L. Sturmann, N. Thureau, N. Turner, S. M. Carroll
Nature 464 (Apr. 2010) pp. 870–872. 2010

The 2010 interferometric imaging beauty contest
F. Malbet, W. Cotton, G. Duvert, P. Lawson, A. Chiavassa, J. Young, F. Baron, D. Buscher, S. Rengaswamy, B. Kloppenborg, M. Vannier, L. Mugnier
Optical and Infrared Interferometry II, 2010

MI-6: Michigan interferometry with six telescopes
J. D. Monnier, M. Anderson, F. Baron, D. H. Berger, X. Che, T. Eckhause, S. Kraus, E. Pedretti, N. Thureau, R. Millan-Gabet, T. ten Brummelaar, P. Irwin, M. Zhao
Optical and Infrared Interferometry II, 2010

Minimizing the Effects of Polarization Crosstalk on the Imaging Fidelity of an Optical Interferometer
D. Buscher, F. Baron, C. Haniff
PASP 121 (Jan. 2009) pp. 45–53. 2009

A binary engine fuelling HD 87643's complex circumstellar environment. Determined using AMBER/VLTI imaging
F. Millour, O. Chesneau, M. Borges Fernandes, A. Meilland, G. Mars, C. Benoist, E. Thiébaut, P. Stee, K.-H. Hofmann, F. Baron, J. Young, P. Bendjoya, A. Carciofi, A. Domiciano de Souza, T. Driebe, S. Jankov, P. Kervella, R. G. Petrov, S. Robbe-Dubois, F. Vakili, L. B. F. M. Waters, G. Weigelt
A&A 507 (Nov. 2009) pp. 317–326. 2009

A high-sensitivity near-infrared science combiner for MROI
F. Baron, E. Block, D. F. Buscher, J. Coyne, M. J. Creech-Eakman, C. A. Haniff, C. A. Jurgenson, J. S. Young
Optical and Infrared Interferometry, 2008

Unambiguous phase retrieval as a cophasing sensor for phased array telescopes
F. Baron, I. Mocoeur, F. Cassaing, L. M. Mugnier
Journal of the Optical Society of America A 25 (Apr. 2008) p. 1000. 2008

Image reconstruction at Cambridge University
F. Baron, J. S. Young
Optical and Infrared Interferometry, 2008

Polarization fidelity in an optical interferometer
D. F. Buscher, F. Baron, C. A. Haniff
Optical and Infrared Interferometry, 2008

Fringe tracking and spatial filtering: phase jumps and dropouts
D. F. Buscher, J. S. Young, F. Baron, C. A. Haniff
Optical and Infrared Interferometry, 2008

BOBCAT - A Photon-efficient Multi-way Combiner for the VLTI
D. Buscher, F. Baron, J. Coyne, C. Haniff, J. Young
The Power of Optical/IR Interferometry: Recent Scientific Results and 2nd Generation, 2008

Multiple-beam Fringe Tracking for the VLTI
F. Cassaing, F. Baron, I. Mocoeur, L. M. Mugnier, G. Rousset, B. Sorrente
The Power of Optical/IR Interferometry: Recent Scientific Results and 2nd Generation, 2008

2008 imaging beauty contest
W. Cotton, J. Monnier, F. Baron, K.-H. Hofmann, S. Kraus, G. Weigelt, S. Rengaswamy, E. Thiébaut, P. Lawson, W. Jaffe, C. Hummel, T. Pauls, H. Schmitt, P. Tuthill, J. Young
Optical and Infrared Interferometry, 2008

Magdalena Ridge Observatory Interferometer: progress toward first light
M. J. Creech-Eakman, V. Romero, D. Westpfahl, C. Cormier, C. Haniff, D. Buscher, E. Bakker, L. Berger, E. Block, T. Coleman, P. Festler, C. Jurgenson, R. King, D. Klinglesmith, K. McCord, A. Olivares, C. Parameswariah, I. Payne, T. Paz, E. Ryan, C. Salcido, F. Santoro, R. Selina, A. Shtromberg, J. Steenson, F. Baron, R. Boysen, J. Coyne, M. Fisher, E. Seneta, X. Sun, N. Thureau, D. Wilson, J. Young
Optical and Infrared Interferometry, 2008

Science case for 1 mas spectro-imagining in the near-infrared
P. J. V. Garcia, J.-P. Berger, A. Marconi, A. Krivov, A. Chiavassa, B. Aringer, B. Nisini, D. Defrére, D. Mawet, D. Schertl, E. Tatuli, E. Thiébaut, F. Baron, F. Malbet, G. Duchéne, G. Weigelt, G. Duvert, G. Henri, H. Klahr, J. Surdej, J.-C. Augereau, J.-F. Claeskens, J. Young, J. Hron, K. Perraut, K.-H. Hofmann, L. Testi, M. Cunha, M. Filho, M. De Becker, O. Absil, O. Chesneau, P. Collette, P.-O. Petrucci, R. Neuhaeuser, R. Corradi, S. Antón, S. Wolf, S. Hoenig, S. Renard, T. Forveille, T. Beckert, T. Lebzelter, T. Harries, V. Borkowski, X. Bonfils
Optical and Infrared Interferometry, 2008

Fringe tracking at the MROI
C. A. Jurgenson, F. G. Santoro, F. Baron, K. McCord, E. K. Block, D. F. Buscher, C. A. Haniff, J. S. Young, T. A. Coleman, M. J. Creech-Eakman
Optical and Infrared Interferometry, 2008

Discovery of a Circumbinary Disk around Herbig Ae/Be System V892 Tauri
J. D. Monnier, A. Tannirkulam, P. G. Tuthill, M. Ireland, R. Cohen, W. C. Danchi, F. Baron

ApJ Letters 681, L97 (July 2008) p. L97. 2008

First Resolved Images of the Eclipsing and Interacting Binary β Lyrae
M. Zhao, D. Gies, J. D. Monnier, N. Thureau, E. Pedretti, F. Baron, A. Merand, T. ten Brummelaar, H. McAlister, S. T. Ridgway, N. Turner, J. Sturmann, L. Sturmann, C. Farrington, P. J. Goldfinger
ApJ Letters 684, L95 (Sept. 2008) p. L95. 2008

Beam combiner studies for the Magdalena Ridge Observatory Interferometer
F. Baron, D. F. Buscher, J. Coyne, M. J. Creech-Eakman, C. A. Haniff, C. A. Jurgenson, J. S. Young
Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, 2006

BRISE: a Multipurpose Bench for Cophasing Sensors
F. Cassaing, B. Sorrente, L. Mugnier, G. Rousset, V. Michau, I. Mocoeur, F. Baron
Visions for Infrared Astronomy, Instrumentation, Mesure, Métrologie, 2006

BRISE: a multipurpose bench for cophasing sensors
F. Cassaing, B. Sorrente, L. Mugnier, G. Rousset, V. Michau, I. Mocoeur, F. Baron
Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, 2006

Activities in the COAST group: 2004-2006
C. A. Haniff, J. E. Baldwin, F. Baron, A. G. Basden, N. A. Bharmal, R. C. Boysen, D. F. Buscher, J. Coyne, R. J. Dace, M. Fisher, C. D. Mackay, R. J. Neill, B. O'Donovan, E. B. Seneta, X. Sun, H. Thorsteinsson, P. J. Warner, D. M. A. Wilson, J. S. Young
Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, 2006

2006 interferometry imaging beauty contest
P. R. Lawson, W. D. Cotton, C. A. Hummel, F. Baron, J. S. Young, S. Kraus, K.-H. Hofmann, G. P. Weigelt, M. Ireland, J. D. Monnier, E. Thiébaut, S. Rengaswamy, O. Chesneau
Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, 2006

DARWIN Fringe Sensor : Experimental Results on the BRISE Bench
I. Mocoeur, F. Cassaing, F. Baron, S. Hofer, H. Thiele
Visions for Infrared Astronomy, Instrumentation, Mesure, Métrologie, 2006

DARWIN fringe sensor: experimental results on the BRISE bench
I. Mocœur, F. Cassaing, F. Baron, L. Mugnier, S. Hofer, H. Thiele
Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, 2006

Multi-telescope instruments cophasing for astronomy
I. Mocoeur, F. Cassaing, F. Baron, A. Blanc, L. Mugnier, G. Rousset, B. Sorrente
SF2A-2005: Semaine de l'Astrophysique Francaise, 2005

Multiple aperture optical telescopes: some key issues for Earth observation from a GEO orbit
L. Mugnier, F. Cassaing, B. Sorrente, F. Baron, M.-T. Velluet, V. Michau, G. Rousset
5th International Conference on Space Optics, 2004

Multiple-aperture optical telescopes: cophasing sensor testbed
B. Sorrente, F. Cassaing, F. Baron, C. Coudrain, B. Fleury, F. Mendez, L. Mugnier, V. Bentadj-Paris, V. Michau, J. Montri, G. Rousset, L. Rousset-Rouvière, M.-T. Velluet
5th International Conference on Space Optics, 2004

Cophasing a wide field multi-aperture array by phase-diversity: influence of aperture redundancy and dilution
F. Baron, F. Cassaing, A. Blanc, D. Laubier
Interferometry in Space, 2003

DARWIN fringe sensor (DWARF): concept study
F. Cassaing, F. Baron, E. Schmidt, S. Hofer, L. Mugnier, M. Barillot, G. Rousset, T. Stuffler, Y. Salvadé, I. Zayer
Earths: DARWIN/TPF and the Search for Extrasolar Terrestrial Planets, 2003

DARWIN Fringe Sensor (DWARF): breadboard development
E. Schmidt, F. Cassaing, S. Hofer, M. Barillot, F. Baron, L. Mugnier, G. Rousset, T. Stuffler
Earths: DARWIN/TPF and the Search for Extrasolar Terrestrial Planets, 2003

CONTACT INFORMATION

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Dept. of Physics and Astronomy
Georgia State University
Atlanta, GA 30303

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fax (404) 413-5481
email bentz@astro.gsu.edu

CURRENT POSITION

Associate Professor of Physics and Astronomy (2016-present)

PREVIOUS POSITIONS

Assistant Professor of Physics and Astronomy, GSU (2010-2016)
Hubble Fellow, Dept. of Physics and Astronomy, U. of CA, Irvine (2009-2010)
Postdoctoral Researcher, Dept. of Physics and Astronomy, U. of CA, Irvine (2007-2009)

RESEARCH INTERESTS

Active Galactic Nuclei (AGNs), Black Hole Masses, Black Hole Scaling Relationships, AGN Physical Structure and Kinematics, Host Galaxy Characteristics

EDUCATION

PhD, Astronomy (June 2007) - Ohio State U., Advisor: B. M. Peterson
MS, Astronomy (March 2005) - Ohio State U.
BS, Physics with College Honors (June 2002) - U. of Washington, Seattle
BS, Astronomy with Math Minor (June 2002) - U. of Washington, Seattle
Diploma, Valedictorian (June 1998) - Mead High School, Spokane, WA

PROFESSIONAL MEMBERSHIPS

American Astronomical Society
International Astronomical Union
American Association of Physics Teachers
American Physical Society

HONORS AND AWARDS

GSU College of Arts & Sciences Oustanding Junior Faculty Award (2014)
GSU College of Arts & Sciences Dean's Early Career Award (2013)
Top 20 Women Professors in Georgia, StateStats.org (2013)
Hubble Fellowship (2009-2010)
Allan Markowitz Graduate Award for Excellence in Observational Astronomy (2006)
National Science Foundation Graduate Research Fellowship (2004-2007)
2nd Place, Mathematics and Physical Sciences, Hayes Graduate Research Forum (2004)
Ohio State U. Graduate Fellowship (2002-2003)
Phi Beta Kappa Inductee (2002)
Baer Prize for Undergraduate Excellence in Astronomy (2000-2001)
Golden Key National Honor Society Inductee (2001)
National Society of Collegiate Scholars Merit Scholarship (2001)
Ronald E. McNair Scholar (2000-2002)
NASA Space Grant Scholar (1998-2002)
UW Undergraduate Scholar (1998-1999, 1999-2000)

Grants

$10,000: GSU Student Technology Fee (ended)
Improving the View: Telescope Upgrades at HLCO

$66,000: Hubble Space Telescope, General Observer Program 13816 (active)
High-Resolution Imaging of Active Galaxies with Direct Black Hole Mass Measurements

$20,000: GSU Student Technology Fee (ended)
Dark Sky Observing from Downtown Atlanta

$13,000: Hubble Space Telescope, General Observer Program 13330 (active)
Mapping the AGN Broad Line Region by Reverberation

$81,000: Hubble Space Telescope, General Observer Program 12961 (active)
A Cepheid Distance to NGC6814

$862,000: National Science Foundation CAREER Program (active)
CAREER: Campaigning for Better Black Hole Mass Relations

$26,000: National Radio Astronomy Observatories, Student Support Grant (ended)
HI Spectroscopy of Reverberation-Mapped AGN Host Galaxies

$54,000: Hubble Space Telescope, General Observer Program 11662 (ended)
Improving the Radius-Luminosity Relationship for Broad-lined AGNs with a New Reverberation Sample

$46,000: Hubble Space Telescope, General Observer Program 11661 (ended)
The Black Hole Mass – Bulge Luminosity Relationship for the Nearest Reverberation-Mapped AGNs

$10,000: Georgia State University Research Initiation Grant (ended)
Testing the State of the Art Techniques in Black Hole Mass Measurements

$97,000: Hubble Fellowship 51251.01 (ended)
A Detailed Study of AGN Broad Line Regions with Reverberation Mapping

$33,000: Hubble Space Telescope, General Observer Program 10181 (ended)
ACS/NICMOS Imaging of Bright Lyman Break Galaxy Candidates from SDSS

Total to date: $1,318,000

Recent Awards of Competitive Observing Time

13.5 hrs: Gemini Observatory Semester 2015A
A Stellar Dynamical Black Hole Mass for the Nearby Seyfert Galaxy NGC5273 (Band 1)

4 nights: WIYN Telescope Semester 2015A (PI: M. Batiste)
Deconstructing Dynamics: Improving AGN $\sigma_\star$ Measurements for Calibration of the $M_{\rm BH} - \sigma_\star$ Relation

14 orbits: Hubble Space Telescope Cycle 22 (2014-2015)
High-Resolution Imaging of Active Galaxies with Direct Black Hole Mass Measurements

179 orbits: Hubble Space Telescope Cycle 21 (2013-2014; PI: B. Peterson, OSU)
Mapping the AGN Broad Line Region by Reverberation

21.5 hrs: Gemini Observatory Semester 2013B
A Stellar Dynamical Black Hole Mass for the Reverberation-Mapped Active Galaxy NGC6814 (Band 1)

182.75 hrs: Green Bank Telescope Semester 2013A (PI: B. Ou-Yang)
HI Spectroscopy of Reverberation-Mapped AGN Host Galaxies

3 nights: WIYN Telescope Semester 2013A (PI: E. Manne-Nicholas)
The Black Hole Mass-Bulge Luminosity Relationship for Reverberation-Mapped AGNs in the Near-IR

19 orbits: Hubble Space Telescope Cycle 20 (2012-2013)
A Cepheid Distance to NGC6814

20 hrs: Gemini Observatory Semester 2012A
A Stellar Dynamical Black Hole Mass for the Reverberation-Mapped Active Galaxy NGC6814 (Band 3: did not execute)

23 hrs: LCOGT Faulkes Telescope South Semester 2012A
STARE: Testing Black Hole Mass Measurements

4 nights: WIYN Telescope Semester 2011B
The Black Hole Mass-Bulge Luminosity Relationship for Reverberation-Mapped AGNs in the Near-IR

24.1 hrs: LCOGT Faulkes Telescope South Semester 2011B
STARE: Testing Black Hole Mass Measurements in Active Galaxies

13 orbits: Hubble Space Telescope Cycle 17 (2009-2010)
Improving the Radius-Luminosity Relationship for Broad-Lined AGNs with a New Reverberation Sample

9 orbits: Hubble Space Telescope Cycle 17 (2009-2010)
The Black Hole Mass–Bulge Luminosity Relationship for the Nearest Reverberation-Mapped AGNs

18 orbits: Hubble Space Telescope Cycle 13 (2005-2006)
ACS/NICMOS Imaging of Bright Lyman Break Galaxy Candidates from SDSS

Recent Conferences and Colloquia

Sep 2016: University of Alabama, Huntsville, AL
May 2016: Contributed talk, *Great Lakes Quasar Symposium*, London, Ontario, Canada
Apr 2016: Spelman College, Atlanta, GA
Apr 2016: Mississippi State University, Starkville MS
Jul 2015: Contributed talk, *AGN STORM Workshop*, Columbus, OH
Jan 2015: Poster, *225th American Astronomical Society Meeting*, Seattle, WA
Nov 2014: **Invited review talk**, *Astronomy at High Angular Resolution* workshop, ESO Headquarters, Garching, Germany
Oct 2014: Wayne State University, Detroit, MI
Oct 2014: University of Michigan, Ann Arbor, MI
Jul 2014: University of Sheffield, South Yorkshire, United Kingdom
May 2014: **Invited talk**, *Apache Point Observatory 25th Anniversary*, Sunspot, NM
Mar 2014: Boston University, Boston, MA
Jan 2014: NRC Herzberg Institute of Astrophysics, Victoria, British Columbia

Jan 2014: Poster, *223rd American Astronomical Society Meeting*, Washington, DC
Oct 2013: University of Kentucky, Lexington, KY
Sep 2013: Clemson University, Clemson, SC
Feb 2013: National Radio Astronomy Observatory, Green Bank, WV
Oct 2012: **Invited keynote talk**, *Georgia Regional Astronomers Meeting*, Georgia Southern University, Statesboro, GA
Aug 2012: **Invited talk**, *Xtreme Astrophysics* symposium at Georgia Institute of Technology, Atlanta, GA
Jul 2012: **Invited review talk**, *Improving Black Hole Masses in AGN* workshop, Dark Cosmology Center, Niels Bohr Institute, Copenhagen, Denmark
Jan 2012: Contributed talk, *219th American Astronomical Society Meeting*, Austin, TX
Nov 2011: Contributed talk, *Georgia Regional Astronomers Meeting*, Agnes Scott College, Decatur, GA
Nov 2011: North Georgia College and State University, Dahlonega, GA
Sep 2011: **Invited talk**, Astrotomography Workshop at *IAU Symposium 285 — New Advances in Time Domain Astronomy*, University of Oxford, England
Sep 2011: **Invited talk**, Light Echoes Workshop at *IAU Symposium 285 — New Advances in Time Domain Astronomy*, University of Oxford, England
Aug 2011: **Invited review talk**, *Single and Double Black Holes in Galaxies* workshop, University of Michigan, Ann Arbor, MI
May 2011: Dark Cosmology Center, Niels Bohr Institute, Copenhagen, Denmark
Apr 2011: Contributed talk, *Narrow-Line Seyfert 1 Galaxies and Their Place in the Universe* conference, Milan, Italy
Sep 2010: Georgia Institute of Technology, Atlanta, GA
Apr 2010: Las Cumbres Observatory, Santa Barbara, CA
Mar 2010: Georgia State University, Atlanta, GA
Mar 2010: Spitzer Science Center/Infrared Processing and Analysis Center
Mar 2010: Contributed talk, *Hubble Fellows Symposium*, Space Telescope Science Institute, Baltimore, MD
Nov 2009: University of Washington, Seattle, WA
Oct 2009: University of Arkansas, Fayetteville, AR
Sep 2009: University of St. Andrews, Scotland
Apr 2009: University of Michigan
Apr 2009: Michigan State University
Apr 2009: Contributed talk, *Intermediate-Mass Black Holes Workshop*, Irvine, CA
Jan 2009: Contributed talk, *213th American Astronomical Society Meeting*, Long Beach, CA
Nov 2008: University of California, Riverside
Nov 2008: University of California, Santa Barbara

Courses Developed and Taught

PHYS1000/7000 "Gateway to Physics", undergraduate major course cross-listed with graduate course, GSU (Fall 2013, 2014)
ASTR8900 "Astronomy Seminar", graduate course, GSU
Spring 2013: Non-Academic Jobs for PhD Astronomers

ASTR4100/6100 "Astronomical Techniques and Instrumentation", undergraduate major course cross-listed with graduate course, GSU (Spring 2012, 2014, 2015)
ASTR1000 "Introduction to the Universe", undergraduate science elective, GSU (Fall 2010 – Fall 2011, Fall 2012 – Spring 2013)
"Algebra Review", Columbus School for Girls (July 2003, July 2004)
"SAT Math Preparation", Columbus School for Girls (July 2003, July 2004)

Pedagogy

Participant, "Physics and Astronomy New Faculty Workshop", American Association of Physics Teachers and American Physical Society, Baltimore, MD, November 2011

Postdocs Advised

Dr. Merida Batiste (PhD: U. Maine), 2014-present

PhD Students Advised

Emily Manne-Nicholas, PhD student, GSU, expected degree date 2017
Benjamin Ou-Yang, PhD student, GSU, expected degree date 2017
Caroline Roberts, PhD student, GSU, expected degree date 2019

Graduate Students Advised

Daniel Horenstein, PhD student, GSU, 2014
Crystal Pope, PhD student, GSU, 2013
Robert Loewenthal, non-degree graduate student, GSU, 2012
Benjamin Williams, MS student, GSU, 2011

Undergraduate and High School Students Advised

Francisco Martinez, BS student (physics), GSU, 2015-2016
James Seals, BS student (physics), GSU, 2015-2016
Bobby Jones, BS student (physics), GSU, 2015
Craig Bazhaw, BS student (physics), GSU, 2014
Kevin Lowery, BS student (physics), GSU, 2014
Gabriela Hernandez, BS student (math), GSU, 2013-2014
Sarah Katz, North Springs Charter High School, 2013-2014
Lawrence Coley, BS student (physics), GSU, 2013
Caroline Roberts, BS student (physics), Sewanee University, 2013
Ricardo Pedraza, BS student (physics), GSU, 2012
Jonathan Gardner, BS student (physics), GSU, 2011
Tyler Drake, BS student (physics), GSU, 2010-2011

Dissertation/Thesis Committees (Member)

Cheuk-Ping Wong, MS, Physics, GSU, Nov 2016
Ganesh Chand, PhD, Physics, GSU, Nov 2015
Joe Eggen, PhD, Astronomy, GSU, July 2014
Jeremy Maune, PhD, Astronomy, GSU, July 2014
Daniel Lawther, MS, Astronomy, University of Copenhagen, May 2013
Laura Patel, PhD, Physics, GSU, Apr 2013
Abhisek Sen, PhD, Physics, GSU, Nov 2012

Travis Fischer, PhD, Astronomy, GSU, Jun 2012
Noel Richardson, PhD, Astronomy, GSU, Apr 2012
Robert Moore, MS, Physics, GSU, Apr 2012

Astronomy Service

National Science Foundation, proposal review panel member, October 2015
Hubble Space Telescope Cycle 22, proposal review panel member, June 2014
National Science Foundation, proposal review panel member, November 2013
NASA Astrophysics Roadmap Committee Member, 2013
Israel Science Foundation, proposal reviewer, April 2013
Scientific Organizing Committee, July 2012 DARK Cosmology Center Workshop, Niels Bohr Institute, University of Copenhagen, Denmark
Kepler Space Telescope Cycle 4, proposal review panel member, April 2012
Estonian Science Foundation Mobilitas Top Researcher Program, proposal reviewer December 2011
Hubble Space Telescope Cycle 18, proposal review panel member, May 2010
Chandra X-ray Observatory Cycle 11, proposal review panel member, June 2009
Scientific Organizing Committee, 5th UC Irvine Center for Cosmology Workshop, *Intermediate-Mass Black Holes: from First Light to Galactic Nuclei*, April 2009
Referee for *Nature*, *ApJ*, *AJ*, *PASP*, *MNRAS*, and *Advances in Astronomy*

University Service

GSU Urban Astronomy Center and Planetarium project co-lead, 2012−present
Astronomy Undergraduate Advisor, GSU, 2012−2016
Society of Physics Students Faculty Advisor, GSU, 2012−2016

College Service

Department representative for Clare Booth Luce Foundation grant proposal planning, 2016−present
Department representative for NSF ADVANCE grant proposal planning, 2015−present
Panelist for NSF CAREER Award Seminar, presented by GSU URSA, Feb 2015

Departmental Service

Physics and Astronomy Promotion Committee, GSU, 2016−present
Physics and Astronomy Executive Committee, GSU, 2016−present
Astronomy Faculty Hiring Committee (solar/stellar), GSU, 2016−present
PI, Next Generation Faculty Proposal, GSU, 2015−present
Physics and Astronomy Faculty Director of Development, GSU, 2015−present
Physics and Astronomy Department Publicity Committee, GSU, 2013−present
Summer Student Program in Astronomy organizer, GSU, 2013−2015
Physics and Astronomy Department Honors Celebration organizer, GSU, 2013−2016
Chair, Astronomy Faculty Hiring Committee (extragalactic), GSU, 2011−2012
Astronomy Faculty Hiring Committee (stellar), GSU, 2011−2012
Physics and Astronomy Department Chair Selection Committee, GSU 2012
Astronomy 2CI Faculty Hiring Committee, GSU, 2011−present
Astronomy Graduate Student Candidacy Exam Committee, GSU, 2011−present
Astronomy Graduate Student Admissions Committee, GSU, 2011−present

Physics and Astronomy Civility Team (PACT) founding member, GSU, 2012−present
Dept. of Physics and Astronomy Website Committee, GSU, 2011−2012
AGN Lunch founder and organizer, GSU, 2010−2012
Women in Physics Lunch founder and organizer, GSU, 2010−2012
Astrophysics Seminar co-organizer, U. of CA, Irvine, 2008−2009
Astrophysics Graduate Seminar organizer, U. of CA, Irvine, 2007−2008

Community Service

Invited public lecture, Atlanta Astronomy Club, May 2016
Invited public lecture, Augusta University, Apr 2016
Co-organizer, Atlanta Science Festival presents Starry Starry Night at Hard Labor Creek Observatory, Mar 2016
Public lecture co-participant, Ebrik Coffee House, Atlanta, GA, Mar 2016
Invited public lecture, Charlie Elliott Astronomy Club, May 2014
Creator and organizer, Astronomy Workshops for Girl Scouts at Georgia State University, partnership with Girl Scouts of Greater Atlanta, 2012−present
Faculty volunteer, Hard Labor Creek Observatory public observing nights, 2011−present
Science Olympiad Middle School Regional Competition, faculty volunteer, 2011−2015

Miscellaneous

69 refereed publications, cited $>$ 3800 times to date, h-index = 34, g-index = 61
18 first-author refereed publications, cited $>$ 1400 times to date, h-index = 14, g-index = 18
9 refereed publications with $>$ 100 citations each (5 as first author, 1 as second author)
Blog post describing "Phynd the Physicist" game written for Women in Astronomy Blog, and republished on Times Higher Education
Inspired the parody article "Metallica's James Hetfield Celebrates a PhD in Astrophysics"
Article describing my research chosen as #3 in the Top 10 GSU Website Stories, 2015
Private pilot license, single engine, visual flight rules, July 2010
Composed *Fantasy on AGNs*, a three-part musical piece in four movements from scientific data. As a member of the Orange County Flute Ensemble, co-organized and performed in a multimedia concert at the U. of CA Irvine Observatory in April 2010 that included the world premiere performance of *Fantasy on AGNs*.

— Publications —

Books

1. Kouveliotou, C., Agol, E., Batalha, N., Bean, J., **Bentz, M.**, Cornish, N., Dressler, A., Gaudi, S., Guyon, O., Hartmann, D., Figueroa-Feliciano, E., Kalirai, J., Niemack, M., Ozel, F., Reynolds, C., Roberge, A., Sheth, K., Straughn, A., Weinberg, D., Zmuidzinas, J. *Enduring Quests, Daring Visions: NASA Astrophysics in the Next Three Decades.* 2013, science.nasa.gov: NAC Astrophysics Subcommittee documents

Refereed Journal Articles

*Note: articles marked with * have* >100 *citations to date (Jan 2017)*

69. Batiste, M., **Bentz, M.C.**, Manne-Nicholas, E.R., Onken, C.A., Bershady, M.A. *The BRAVE Program I. Improved Bulge Stellar Velocity Dispersion Estimates for a Sample of Active Galaxies.* 2017, Astrophysical Journal, in press (astro-ph/1612.02810)
68. Starkey, D., Horne, K., Fausnaugh, M. M., Peterson, B. M., **Bentz, M. C.**, et al. *Space Telescope and Optical Reverberation Mapping Project. VI. Reverberating Disk Models for NGC 5548.* 2017, Astrophysical Journal, in press (astro-ph/1611.06051)
67. **Bentz, M.C.**, Batiste, M., Seals, J., Garcia, K., Kuzio de Naray, R., Peters, W., Anderson, M.D., Jones, J., Lester, K., Machuca, C., Parks, J.R., Pope, C.L., Revalski, M., Roberts, C.A., Saylor, D., Sevrinsky, R.A., Turner,C. *A Low-Mass Black Hole in the Nearby Seyfert Galaxy UGC 06728.* 2016, Astrophysical Journal, Vol. 831, p. 2
66. **Bentz, M.C.**, Cackett, E.M., Crenshaw, D.M., Horne, K.,Street, R., Ou-Yang, B. *A Reverberation-Based Black Hole Mass for MCG-06-30-15.* 2016, Astrophysical Journal, Vol. 830, p. 136
65. Goad, M.R., Korista, K.T., De Rosa, G., Kriss, G.A., Edelson, R., Barth, A. J., Ferland, G. J., Kochanek, C. S., Netzer, H., Peterson, B. M., **Bentz, M.C.**, et al. *Space Telescope and Optical Reverberation Mapping Project. IV. Anomalous Behavior of the Broad Ultraviolet Emission Lines in NGC 5548.* 2016, Astrophysical Journal, Vol. 824, p. 11
64. Barth, A.J., **Bentz, M.C.** *No Evidence for [O III] Variability in Mrk 142.* 2016, Monthly Notices of the Royal Astronomical Society, Vol. 458, p. 109
63. Fausnaugh, M.M., Denney, K.D., Barth, A.J., **Bentz, M.C.**, et al. *Space Telescope and Optical Reverberation Mapping Project. III. Optical Continuum Emission and Broad-Band Time Delays.* 2016, Astrophysical Journal, Vol. 821, p. 56
62. Troyer, J., Starkey, D., Cackett, E.M., **Bentz, M.C.**, Goad, M.R., Horne, K., Seals, J.E. *Correlated X-ray/Ultraviolet/Optical Variability in NGC 6814.* 2015, Monthly Notices of the Royal Astronomical Society, Vol. 456, p. 4040
61. Skielboe, A., Pancoast, A., Treu, T., Park, D., Barth, A.J., **Bentz, M.C.** *Reverberation Mapping by Regularized Linear Inversion: Velocity-Delay Maps for the Lick AGN Monitoring Project 2008 Dataset.* 2015, Monthly Notices of the Royal Astronomical Society, Vol. 454, p. 144
60. Cackett, E.M., Gultekin, K., **Bentz, M.C.**, Fausnaugh, M.M., Peterson, B.M., Troyer, J., Vestergaard, M. *Swift/UVOT Grism Monitoring of NGC 5548 in 2013: An Attempt at MgII Reverberation Mapping.* 2015, Astrophysical Journal, Vol. 810, p. 86

59. Edelson, R., Gelbord, J.M., Horne, K., McHardy, I.M., Peterson, B.M., Arevalo, P., Breeveld, A.A., De Rosa, G., Evans, P.A., Goad, M.R., Kriss, G.A., Dwelly, T., Gehrels, N., Grupe, D., Kennea, J.A., Jousek, J.A., Papadakis, I., Siegel, M., Starkey, D., Uttley, P., Vaughan, S., Young, S., Barth, A.J., **Bentz, M.C.**, et al. *Space Telescope and Optical Reverberation Mapping Project. II. Swift and HST Reverberation Mapping of the Accretion Disk of NGC 5548.* 2015, Astrophysical Journal, Vol. 806, p. 129
58. De Rosa, G., Peterson, B.M., Ely, J., Kriss, G.A., Crenshaw, D.M., Horne, K., Korista, K.T., Netzer, H., Pogge, R.W., Arevalo, P., Barth, A.J., **Bentz, M.C.**, et al. *Space Telescope and Optical Reverberation Mapping Project. I. Ultraviolet Observations of the Seyfert 1 Galaxy NGC 5548 with the Cosmic Origins Spectrograph on Hubble Space Telescope.* 2015, Astrophysical Journal, Vol. 806, p. 128
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Circulars, Conference Proceedings, and Non-refereed Journal Articles

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18. Seigar, M.S., Berrier, J.C., Davis, B.L., Kennefick, D., Kennefick, J., Barrows, R.S., Hartley, M.T., Shields, D.W., **Bentz, M.C.**, Lacy, C.H.S. *The Arkansas Galaxy Evolution Survey: SMBH Mass and Spiral Arm Morphology.* 2014, in ASP Conf. Ser. 480, Structure and Dynamics of Disk Galaxies, ed. M.S. Seigar & P. Treuthardt (San Francisco: ASP), p. 196
17. Bond, H., **Bentz, M.C.**, Clayton, G., Rest, A. *Light Echoes.* 2012, in Proc. IAUS No. 285, New Horizons in Time Domain Astronomy, ed. R.E.M. Griffin, R.J. Hanisch, & R. Seaman (Cambridge: Cambridge University Press), p. 215
16. Horne, K., Baptista, R., **Bentz, M.C.**, Steeghs, D. *Astrotomography.* 2012, in Proc. IAUS No. 285, New Horizons in Time Domain Astronomy, ed. R.E.M. Griffin, R.J. Hanisch, & R. Seaman (Cambridge: Cambridge University Press), p. 227
15. Grier, C.J., Peterson, B.M., Denney, K.D., Martini, P., Pogge, R.W., **Bentz, M.C.** *New Results in Reverberation Mapping.* 2011, in Proceedings of Narrow-Line Seyfert 1 Galaxies and Their Place in the Universe, PoS(NLS1)052
14. Denney, K.D., Assef, R.J., **Bentz, M.C.**, Dietrich, M., Horne, K., Kochanek, C.S., Mathur, S., Peterson, B.M., Pogge, R.W., Vestergaard, M. *Addressing Systematic Uncertainties in Black Hole Mass Measurements.* 2011, in Proceedings of Narrow-Line Seyfert 1 Galaxies and Their Place in the Universe, PoS(NLS1)034
13. **Bentz, M.C.** *Black Hole Scaling Relationships and NLS1s.* 2011, in Proceedings of Narrow-Line Seyfert 1 Galaxies and Their Place in the Universe, PoS(NLS1)033
12. Landt, H., **Bentz, M.C.**, Peterson, B.M., Elvis, M., Ward, M.J., Korista, K.T., Karovska, M. *The Near-IR Broad-emission Line Region of AGN.* 2011, in Proceedings of Narrow-Line Seyfert 1 Galaxies and Their Place in the Universe, PoS(NLS1)009
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10. Denney, K.D., Peterson, B.M., Pogge, R.W., **Bentz, M.C.**, et al. *Reverberation Mapping Results from MDM Observatory.* 2010, in Proc. IAUS No. 267, Co-Evolution of Central Black Holes and Galaxies, ed. B.M. Peterson, R.S. Somerville, & T. Storchi-Bergmann, p. 201
9. **Bentz, M.C.**, and the LAMP Collaboration. *New Reverberation Mapping Results from the Lick AGN Monitoring Project.* 2010, in Proc. IAUS No. 267, Co-Evolution of Central Black Holes and Galaxies, ed. B.M. Peterson, R.S. Somerville, & T. Storchi-Bergmann, p. 197
8. **Bentz, M.C.**, Walsh, J.L., Silverman, J.M., Steele, T.N., Filippenko, A.V., Blondin, S., & Berlind, P. *Supernova 2008bx in MCG +07-31-4.* 2008, Central Bureau Electronic Telegrams, Vol. 1359
7. Malkan, M.A., **Bentz, M.C.**, Thornton, C.E., Silverman, J.M., Steele, T.N., & Filippenko, A.V. *Supernova 2008be in NGC 5671.* 2008, Central Bureau Electronic Telegrams, Vol. 1321
6. Barth, A.J., **Bentz, M.C.**, Thornton, C.E., Chornock, R., & Filippenko, A.V. *Supernova 2008bh in NGC 2642.* 2008, Central Bureau Electronic Telegrams, Vol. 1313
5. **Bentz, M.C.**, Denney, K.D., Peterson, B.M., & Pogge, R.W. *Refining the Radius–Luminosity Relationship for Active Galactic Nuclei.* 2007, in ASP Conf. Ser. 373, The Central Engine of Active Galactic Nuclei, ed. L.C. Ho & J.-M. Wang (San Francisco: ASP), p. 380
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3. Peterson, B.M., & **Bentz, M.C.** *Black Hole Masses from Reverberation Mapping.* 2006, New Astronomy Reviews, Vol. 50, p. 796
2. **Bentz, M.C.**, Osmer, P.S., & Weinberg, D.H. *Bright Lyman-Break Galaxy Candidates in the SDSS First Data Release.* 2004, in Proc. IAUS No. 222, The Interplay Among Black Holes, Stars, and ISM in Galactic Nuclei, ed. T. Storchi-Bergmann, L.C. Ho, & H.R. Schmitt (Cambridge, UK: Cambridge University Press), p. 515
1. **Bentz, M.C.** & Osmer, P.S. *A Search for Nitrogen Enriched Quasars in the SDSS Early Data Release.* 2004, in ASP Conf. Ser. 311, AGN Physics with the Sloan Digital Sky Survey, ed. G.T. Richards & P.B. Hall (San Francisco: ASP), p. 289

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Curriculum Vitae

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Current Position

As of Aug 17, 2015

- Assistant Professor, Department of Physics and Astronomy, Georgia State University
- RIKEN-Brookhaven Research Center Fellow

Research Interests

- Using high momentum probes to quantify the properties of the Quark Gluon Plasma produced in heavy ion collisions and understanding the influence of the initial state in these collisions.

Education

September 2011

- Stony Brook University
  Ph.D. in Physics
  Dissertation: Direct Photon Tagged Jets in 200 GeV Au+Au Collisions at PHENIX
  Advisor: Professor Barbara Jacak

May 2005

- University of Massachusetts, Amherst
  B. S. in Physics and Mathematics
  Honors: Magna cum laude

Previous Positions

Sept 2014-Aug 2015

- Yale University
  Associate Research Scientist, Yale Heavy-Ion Group in ALICE

Previous Positions (continued)

Oct 2011 - Sept 2014	• Yale University Postdoctoral Associate, Yale Heavy-Ion Group in ALICE
June 2006 - Sept 2011	• Stony Brook University Research Assistant, Heavy-Ion Group in PHENIX
Summer 2004	• University of Chicago advisor: Dr. Young Kee-Kim Summer Undergraduate Researcher (REU)
June 2003-Aug 2005	• University of Massachusetts Amherst advisors: Dr. Narayanan Menon (Physics Dept.) and Dr. Thomas Russell (Polymer Science Dept.) Undergraduate Research (REU summer 2003)

Additional Research Roles

December 2019	• Local Organizer, sPHENIX Collaboration Meeting, GSU
June 2016-2018	• Member of RHIC-AGS User Executive Council
April 2016	• Local organizing committee for the workshop "High p_T in the RHIC and LHC Era (BNL/RBRC)"
March 2016-2017	• Junior representative for sPHENIX Executive Council
Feb 2016-2018	• Member of PHENIX Executive Council
Jan 2016-present	• sPHENIX Hadronic Calorimeter Prototype Manager
Aug 2015-present	• sPHENIX Institutional Board Representative for GSU
Dec 2015-2016	• PHENIX Juniors Committee Member

Additional Research Roles (continued)

April 2013 - April 2015	• Convener of the ALICE Correlation and Event by Event (Corr/EbyE) Physics Analysis Group (PAG)
2009-2010	• RHIC-AGS User Executive Council as Graduate Student/Post Doctorate Representative

Teaching/Outreach Experience

Spring 2017	• Principles of Physics II, Georgia State University (PHYS 2212)
Fall 2016	• Principles of Physics I, Georgia State University (PHYS 2211)
Fall 2015, 2016	• Adopt-a-Physicist
Spring 2015	• Yale Scientific Teaching Fellow
Fall 2014	• Yale Physics Olympics Executive committee
Sept. 2005 - Dec. 2006	• Teaching Assistant, Stony Brook University
Fall 2001 - May 2005	• Lecture Prep Assistant, University of Massachusetts at Amherst
Fall 2001-May 2005	• Physics Outreach Club, University of Massachusetts at Amherst
Summer 2006	• Tutor Counselor, Upward Bound Program, Bristol Community College

Honors and Awards

- Poster Award, Quark Matter 2014 (8 of approximately 372 posters were selected to present a 5 minute "flashtalk" during a plenary session)
- 2011 Gertrude Goldhaber Award Brookhaven National Lab Women in Science

Honors and Awards (continued)

- Kandula Book Award, Physics Department, University of Massachusetts, Amherst, 2005

- Millman Scholarship, College of Natural Sciences and Mathematics, University of Massachusetts, Amherst, 2005

Invited Talks

- "Recent Results from ALICE", SLAC Summer Institute, SLAC, CA, August 2016

- "sPHENIX", RHIC-AGS Users Meeting, BNL, June 2016

- "Building a State-of-the-Art Jet Detector at RHIC", seminar, Lehigh University, April 2016

- "Probing the Quark Gluon Plasma with Jets at RHIC and LHC", Nuclear Physics Seminar, Rutgers University, March 2016

- "Probing the Quark Gluon Plasma with Jets from RHIC to the LHC"
  Frontiers of QCD in Jets and Heavy Flavor Physics Workshop of DNP Meeting of APS, Santa Fe, NM, October 2015

- "Jet Measurements in Pb-Pb and p-Pb with ALICE "
  Conference on the Intersections of Particle and Nuclear Physics, Vail, CO, May 2015

- "p-A Collisions at the LHC: Latest Results and Prospects "
  POETIC Conference, New Haven, CT, September 2014

- "Correlations in p(d)A collisions at RHIC and LHC"
  3rd Workshop on Jet Modification in the RHIC and LHC Era, Detriot, MI, August 2014

- "Recent Results from ALICE"
  MIAMI Conference, Miami, FL, December 2013

- "What Jet Correlations Teach Us About the Quark Gluon Plasma"
  AFCI Seminar, University of Massachusetts Amherst, November 2013

- "Jets and High p_T Probes"
  DNP Meeting of APS, Newport News, VA, October 2013

Invited Talks (continued)

- "Probing the Quark Gluon Plasma with Direct Photon-Hadron Correlations"
  Heavy Ion Group Seminar, Yale University, May 2011

- "Probing the Quark Gluon Plasma with Direct Photon-Hadron Correlations"
  Nuclear Seminar, Iowa State University, May 2011

Contributed Presentations

- "Fulfilling the RHIC mission with sPHENIX," 32th Winter Workshop on Nuclear Dynamics (WWND 2016) : Guadeloupe, French West Indies, February 2016 (*(Proceedings: J. Phys. Conf. Ser. 736 (2016) 012027))*

- "The importance of surface biases studies for correlation analyses"
  Santa Fe Jets and Heavy Flavor Workshop, Santa Fe, NM, January 2016

- "Understanding Jet Energy loss with Pb-Pb and p-Pb collisions at ALICE"
  Hard Probes Conference, Montreal, Canda, June 2015

- "Quantifying Cold Nuclear Matter Effects on Jet Observables in p-Pb Collisions"
  International Conference on the Initial Stages in High-Energy Nuclear Collisions, Napa, CA, December 2014

- "Jets in p-Pb collisions at ALICE"
  Second Annual Conference on Large Hadron Collider Physics (LHCP), New York, NY, June 2014 (*(Proceedings: arXiv:1409.4655))*

- "Jet Spectra in p-Pb collisions at ALICE" (poster and flash talk)
  Quark Matter, Darmstadt, Germany, May 2014, (*(Proceedings: Nucl. Phys. A 931 (2014) 1174-1178 (arXiv:1409.3468))*

- "Jet-Hadron Correlations in Pb-Pb Collisions with ALICE"
  Hot Quarks, Puerto Rico, October 2012 (*(Proceedings: J. Phys.: Conf. Ser. 446 012009 (2013))*

- "Direct Photon Tagged Jets in 200 GeV Au+Au Collisions at PHENIX" (Poster)
  RHIC-AGS Users Meeting, Brookhaven National Lab, Upton NY, May 2011

Contributed Presentations (continued)

- "Direct Photon-Hadron Correlations Measured with the PHENIX Detector"
  DIS Conference, Newport News VA, April 2011
  (Proceedings: https://wiki.bnl.gov/conferences/images/d/d3/Parallel.QCD-HFS.MeganConnors.0414.proceedings.pdf)

- "Direct Photon-Hadron Correlations Measured with the PHENIX Detector"
  Hard Probes Conference, Eliat Israel, October 2010

- "Direct Photon-Hadron Correlations Measured with the PHENIX Detector"
  Jet Summer School, LBNL, Berkley CA, June 2010

- "Direct Photon-Hadron Correlations Measured in Au+Au at $\sqrt{s_{NN}}$ = 200 GeV Collisions with the PHENIX Detector"
  APS Meeting, Washington D. C., February 2010

- "Direct-Photon Hadron Correlations Measured with PHENIX in Au+Au at 200 GeV" (Poster)
  RHIC-AGS Users Meeting, BNL, Upton NY, June 2009

- "Direct Photon-Hadron Correlations Measured with the PHENIX Detector"
  Quark Matter, Knoxville, TN, April 2009

- "Direct photon hadron correlations measured using the PHENIX detector"
  DNP Meeting of APS, Oakland, CA, October 2008

- "Photon-hadron Correlations Measured in Au-Au Collisions at $\sqrt{s_{NN}}$ = 200 GeV with the PHENIX Detector"
  APS Meeting, St. Louis, MO, April 2008

Thesis Committee Membership

- Cheuk-Ping Wong, Masters, Physics, GSU, November 2016
- Churamani Paudel, Masters, Physics, GSU, September 2016
- Dicy Saylor, Masters, Astronmy, GSU, February 2016
- Hari Guragain, PhD, Physics, GSU, October 2015

Selected Publications

- "Jet-like Correlations with neutral pion triggers in pp and central Pb-Pb collisions at 2.76 TeV," Adam et al. (ALICE) Phys. Lett. B763 (2016) 238.

- "Medium Modification of Jet Fragmentation in Au+Au Collisions at $\sqrt{s_{NN}}$ = 200 GeV Measured in Direct Photon-Hadron Correlations"
  Adare, A. et al. (PHENIX) Phys.Rev.Lett. 111 (2013) 3, 032301 arXiv:1212.3323 [nucl-ex]

- "Measurement of Direct Photons in Au+Au Collisions at $\sqrt{s_{NN}}$ = 200 GeV"
  Afanasiev, S. et al. (PHENIX) Phys.Rev.Lett. 109 (2012) 152302 arXiv:1205.5759 [nucl-ex]

- "Design, Construction, Operation and Performance of a Hadron Blind Detector for the PHENIX Experiment"
  W. Anderson et al., Nucl.Instrum.Meth. A646 (2011) 35-58

- "High p_T Direct Photon and π^0-triggered Azimuthal Jet Correlations in p+p collisions at $\sqrt{s}$ = 200 GeV"
  A. Adare et al. (PHENIX), Phys.Rev. D82 (2010) 072001

- "Photon-Hadron Jet Correlations in p+p and Au+Au Collisions at $\sqrt{s_{NN}}$ = 200 GeV"
  A. Adare et al. (PHENIX), Phys. Rev. C 80, 024908 (2009)

- "Capillary Wrinkling of Floating Thin Polymer Films"
  Jiangshui Huang et. al., Science 3 August 2007 317: 650-653
  Role:Second Author listed as Megan Juszkiewicz; related to undergraduate research project

- Full list of ALICE and PHENIX publications provided upon request

Curriculum Vitae

D. Michael Crenshaw
Distinguished University Professor and Chair
Department of Physics and Astronomy
Georgia State University

Education

Ph.D., in Astronomy, The Ohio State University, 1985
B.S., cum laude, in Physics, Georgia State University, 1979

Professional Credentials

Chair, Department of Physics and Astronomy, Georgia State University (June 2012 – present)
Distinguished University Professor, Georgia State University (July 2016 – present)
Graduate Director for Astronomy (Department of Physics and Astronomy, Georgia State University (November 2011 – May 2012)
Full Professor, Department of Physics and Astronomy, Georgia State University (August 2007 – present)
Associate Professor, Department of Physics and Astronomy, Georgia State University (August 2001 – July 2007)
Research Assistant Professor, Department of Physics, The Catholic University of America (January 1997 – July 2001)
Goddard High Resolution Spectrograph (GHRS) Research Associate, Computer Sciences Corporation, NASA's Goddard Space Flight Center (January 1990 – September 1997)
Adjunct Associate Professor, University of Maryland (September 1988 – July 1994)
International Ultraviolet Explorer (IUE) Resident Astronomer, Computer Sciences Corporation, NASA's Goddard Space Flight Center (July 1985 – December 1989)

Teaching Experience

Department of Physics and Astronomy, Georgia State University (August 2001 – present): undergraduate introductory astronomy courses, graduate courses on the interstellar medium and extragalactic astronomy
Department of Astronomy, University of Maryland (September 1988 – July 1994): introductory astronomy

Service Experience (at Georgia State University)

Chair, Department of Physics and Astronomy (June 2012 – present)
Board of Governors for GSU's Partnership with the Astrophysical Research Consortium on the Apache Point 3.5-m Telescope (November 2014 - present)
GSU Representative for the Association of Universities for Research in Astronomy (AURA) (2014 – present)
Search Committees, Director of the Apache Point Observatory, Director of After Sloan IV
Search Committee, GSU Associate Provost for Faculty Affairs (October 2015 – January 2016)

Dean's Triennial Evaluation Committee (January 2015 – March 2015)
Graduate Director for Astronomy (November 2011 – May 2012)
Undergraduate Advisor for Astronomy (August 2009 – May 2012)
Astronomy Club Advisor (August 2009 – May 2012)
Society of Physics Students (SPS) Advisor (August 2008 – May 2012)
Executive Committee, Department of Physics and Astronomy (August 2009 – May 2012)
Promotion and Tenure Committee, Dept. of Physics and Astronomy (August 2008 – May 2012)
Curriculum Committee, Department of Physics and Astronomy (June 2008 – present)
Astronomy Summer Student Program Committee, Co-Chair (August 2001 – present)
Introductory Astronomy Textbook Committee (August 2001 – present)
Astronomy Graduate Curriculum Committee (August 2001 – present)
Astronomy Graduate Recruitment Committee (August 2001 – present)
Astronomy Ph.D. Qualifying Examination Committee (August 2001 – present)
Coordinator for SPS Sponsored Competitions, Georgia Science Olympiad Tournament at GSU (February 2009)
Faculty Awards Committee, College of Arts and Sciences (August 2005 – August 2007), Chair (August 2005 – August 2006)
Executive Committee, College of Arts and Sciences (August 2004 – August 2006)
Geosciences Fact-Finding Subcommittee Chair (Exec. Comm.) (October 2005)
Coordinator for annual "Reach for the Stars" event, Georgia Science Olympiad Tournament at GSU (2003 – 2005)
Graduate Council, College of Arts and Sciences (September 2003 – August 2004)

Business and Professional Experience (at NASA's Goddard Space Flight Center)
Operation of astronomical satellites (1985 – 1989)
Calibration of astronomical instrumentation (1985 – 1997)
Flight software testing (1985 – 1997)

Courses Taught at Georgia State University
Astr 1010 – introductory solar system astronomy
Astr 1020 – introductory stellar and extragalactic astronomy
Astr 4010 – undergraduate astronomical methods laboratory
Phys 4950 – senior research
Astr 8300 – graduate interstellar medium
Astr 8400 – graduate extragalactic astronomy
Astr 8710 – research topics in astronomy
Astr 8900 – graduate seminar in astronomy
Astr 8910 – directed study in astronomy
Astr 9999 – doctoral dissertation research

Doctoral Dissertations Supervised (current and previous)
José R. Ruiz, CUA, "Examining the Kinematics of Narrow-Line Region Gas in Active Galaxies using the Hubble Space Telescope" (Ph.D. received October 2003)
Varendra Das, GSU, "Kinematics of the Narrow-Line Regions in the Seyfert Galaxies NGC 4151 and NGC 1068" (Ph.D. received August 2006)

Rajesh Deo, GSU, "Dust within the Central Regions of Seyfert Galaxies" (Ph.D. received August 2007)
Jay P. Dunn, GSU, "Intrinsic Absorption with the Far Ultraviolet Spectroscopic Explorer" (Ph.D. received December 2007)
Margaret Trippe, GSU, "A Multiwavelength Investigation of Seyfert 1.8 and 1.9 Galaxies" (Ph.D. received August 2009)
Stephen Rafter, GSU, "Fundamental Properties of Low-Redshift AGN in the Sloan Digital Sky Survey" (Ph.D. received May 2010)
Travis Fischer, GSU, "Determining the Inclinations of Active Galactic Nuclei Using Narrow-Line Region Kinematics" (Ph.D. received August 2012)
Crystal Pope, GSU, "Kinematics of Seyfert Galaxy Narrow-Line Regions based on Gemini Integral Field Unit Observations", ongoing.
Mitchell Revalski, GSU, "Mass Outflow in the Narrow-Line Regions of AGN", ongoing.

Additional Doctoral Dissertation Committees (completed)
Jack R. Gabel, "The Physical Nature of Low-Ionization Nuclear Emission Line Regions and their Relation to Active Galactic Nuclei" (CUA, Ph.D. received October 2000)
M. Virginia McSwain, "The Evolution of Massive Stars: The Be Star and Microquasar Phenomenon" (GSU, Ph.D. received May 2004)
Amy. M. Campbell, "The Character of Optical Variability for X-ray Selected Blazars" (GSU, Ph.D. received May 2004)
John P. McFarland, "Rest-Frame Variability Characteristics of Blazars" (GSU, Ph.D. received May 2005)
Nick R. Collins, "Photoionization Models of the Narrow-Line Region in the Seyfert Galaxy Mrk 3" (The Catholic University of America, Ph.D. received May 2006)
Paramita Barai, "Modeling the Power Evolution of Classical Double Radio Galaxies over Cosmological Scales" (GSU, Ph.D. received August 2006)
M. Angela Osterman, "New Multiwavelength Variability and Optical Microvariability Investigations of X-ray and Radio Loud Selected Blazars" (GSU, Ph.D. received December 2006)
Kevin Marshall, "X-ray Variability of Seyfert Galaxies" (GSU, Ph.D. received December 2006)
Eunwoo Choi, "Numerical Hydrodynamics of Relativistic Extragalactic Jets" (GSU, Ph.D. received May 2007)
Marcio Melendez, "Constraining the AGN Contribution in a Multiwavelength Study of Seyfert Galaxies (Catholic University of America, Ph.D. received May 2008)
Wesley Ryle, "Investigation of Fundamental Black Hole Properties of AGN Through Optical Variability" (GSU, Ph.D. received August 2008)
Paola Rodriguez Hidalgo, "High Velocity Outflows in Quasars" (University of Florida, Ph.D. received December 2008)
Sebastian Zamfir, "Sloan Digital Sky Survey QSOs in the Context of the 4D Eigenvector 1 Parameter Space" (University of Alabama, Ph.D. received May 2009)
Ayao Mamert Sossah, "Photoionization of the Potassium Isoelectronic Sequence: Ca^{+} and Transition Metal Ions" (GSU, Ph.D. received August 2010)
Megan Johnson, "The Evolution of Dwarf Irregular Galaxy NGC 1569: A Kinematic Study of the Stars and Gas" (GSU, Ph.D. received August 2011).

Branyon May, "Multiwavelength Selection of Obscured AGN and Contributions to the X-ray Background" (University of Alabama, Ph.D. in Physics received August 2011)
Aden Draper, "Understanding the Connection Between Active Galactic Nuclei and Host Star Formation Through Multi-Wavelength Population Synthesis Modeling" (Georgia Institute of Technology, Ph.D. received December 2012)
Joseph Eggen, "Optical Polarimetry and Gamma-ray Observations of a Sample of Radio-Loud Narrow Line Seyfert 1 Galaxies" (GSU, Ph.D. received May 2014)
Jeremy Maune, "Detection of Microvariability in a New Class of Blazar-Like AGN" (GSU, Ph.D. received May 2014)
Mohammad Javani, "Photoionization of Fullerenes and Atoms Confined in Fullerenes", Committee member (GSU, Ph.D. received December 2014)

Additional Master's Thesis Committees (completed)
Alana May, "Testing the Sersic Bulge – Black Hole Mass Relation in Seyfert Galaxies" (University of Alabama, M.S. received May 2010)
Hannah Marine Clemens, "Microvariability of the Quasar 3C 279" (GSU, M.S. received August 2010)
Erin Darnell, "Diffuse Ionized Regions in the Vicinity of Active Galaxies" (University of Alabama, M.S. in Physics received December 2011)
Greggory Rothmeier, "Brain Tissue Temperature Dynamics During Functional Activity and Possibilities of Optical Measurement Techniques", (GSU, M.S. in Physics received May 2012)

Additional Students Supervised
2 high school senior projects (1992, 1999)
19 undergraduate research projects (1987 – present)
6 additional graduate research projects (1987 – present)

Postdoctoral Researchers Supervised
Dr. Jack R. Gabel, CUA (January 2001 – August 2003)
Dr. Matthias Dietrich, GSU (October 2002 – September 2004)
Dr. Travis C. Fischer, GSU (September 2012 – August 2015)

Editorial/Review Activities

1. Referee for articles in the Astrophysical Journal (ApJ), the Astronomical Journal (AJ), Monthly Notices of the Royal Astronomical Society (MNRAS), Astronomy & Astrophysics (A&A), Publications of the Astronomical Society of the Pacific (PASP), Astrophysics and Space Science (Ap&SS), Publications of the Astronomical Society of Japan (PASJ) (1986 – present)

2. Member of peer review committees for proposals to use the International Ultraviolet Explorer (IUE), the Extreme Ultraviolet Explorer (EUVE), the Chandra X-ray Observatory (CXO), the Galaxy Evolution Explorer (GALEX), the Hubble Space Telescope (HST), and NASA's Astrophysics Data Program (ADP) (1988 – present)

3. Chair of CXO Peer Review Panel on Active Galactic Nuclei (June 2004, June 2014)

4. Member of Chandra Committee (January 2007), Hubble Fellowship Committee (January 2016), and NASA Postdoctoral Program (2015, 2016)

5. Member of NSF review panels for Research Experiences for Undergraduates proposals and Astronomy & Astrophysics Research Grants (2007 – present)

6. Referee for National Science Foundation (NSF), Natural Sciences and Engineering Research Council (NSERC, Canada), Netherlands Organization for Scientific Research (NWO), Cerra Tololo Inter-American Observatory (CTIO), and U.S. Civilian Research and Development Foundation (CRDF) proposals (1998 – present)

7. External reference writer for promotion and tenure evaluations at Creighton University, Rhodes College, Bucknell University, University of California at Riverside, University of Haifa, and University of Oklahoma (2013 – present).

Internal Grants (Crenshaw as GSU Co-PI, 2001 – present)

1. "Program in Extragalactic Astronomy", GSU Research Program Enhancement (non-competing renewal), 7/1/02 - 6/30/05, $135K

   The previous RPE program has been transformed to provide continuing long-term support of graduate students within the Department of Physics and Astronomy.

External Grants (Crenshaw as GSU Principal Investigator, 2001 – present)

1. "Post-COSTAR FOS Spectra of Quasars", Harvard-Smithsonian Center for Astrophysics, 10/1/01 - 9/30/02, $22.9K

2. "Determining the Nature of the Variable Absorption in AGN: Monitoring NGC 3783 with HST and Chandra", Space Telescope Science Institute, NASA, 9/1/01 - 8/31/03, $132.2K

3. "Simultaneous HST/Chandra Observations of the X-ray/UV Absorbers in Seyfert 1 Galaxies", Space Telescope Science Institute, NASA, 9/1/01 - 8/31/03, $25.9K

4. "Resolving the Warm Absorber in NGC 5548", Space Telescope Science Institute, NASA, 2/1/02 - 1/31/04, $36.3K

5. "Resolving the Warm Absorber in NGC 5548", Chandra X-ray Observatory, NASA, 2/4/02 - 2/3/04, $41.9K

6. "Revealing the Nature of the X-ray Absorption in NGC 4151", Space Telescope Science Institute, NASA, 5/1/02 - 4/30/04, $24.7K

7. “Connecting the UV and X-ray Absorbers in NGC 5548”, Space Telescope Science Institute, NASA, 2/1/04 - 1/31/06, $17.1K

8. “AGN Black Hole Masses from Stellar Dynamics”, Space Telescope Science Institute, NASA, 2/1/04 - 1/31/06, $11.7K

9. “Radial-Velocity Variations of an Intrinsic Absorber in NGC 3783”, Far Ultraviolet Spectroscopic Explorer program, NASA, 5/1/04 -4/30/05, $38.7K

10. “A Comprehensive FUSE Survey of Mass Outflow from AGN", Astrophysics Data Program, NASA, 1/15/05 - 1/14/08, $189.0K ($61.2K received for 1st year, $63.0K received for 2nd year, $64.8K received for 3rd year)

11. “Variable Absorption in the Seyfert Galaxy NGC 3516: Evidence for an Accretion-Disk Wind?”, Far Ultraviolet Spectroscopic Explorer program, NASA, , 7/1/06 – 6/30/08, $25.0K

12. “Are Narrow-Line Seyfert 1 Galaxies Viewed Pole-on?”, Space Telescope Science Institute, NASA, 6/1/09 – 5/30/11, $50.8K

13. “Deconstructing AGN X-ray Spectra”, Space Telescope Science Institute, NASA, 12/1/09 – 11/30/11, $30.4K

14. “Probing the Highest Ionization Gas in the Narrow-Line Regions of Active Galaxies”, Astrophysics Data Analysis Program, NASA, 12/16/09 – 12/15/13, $171.2K

15. “What are the Locations and Kinematics of Mass Outflows in AGN?”, Space Telescope Science Institute, NASA, 11/1/10 – 10/31/13, $133.2K

16. “What are the Structure, Power, and Impact of AGN Winds?”, National Science Foundation, 9/1/12 – 8/31/16, $447.4K

17. “What is the Impact of Narrow-Line Region Outflows on AGN Feedback?”, Space Telescope Science Institute, NASA, 11/1/15 – 10/31/17, $77.0K

Professional Affiliations

American Astronomical Society
International Astronomical Union
Sigma Pi Sigma Physics Honor Society

Other Professional Activities

Space Telescope and Optical Reverberation Mapping (STORM) project member (2014 – present)
Hubble Space Telescope Financial Review Committee (August 2011 – December 2012)

Scientific Organizing Committee for "AGN Winds in Charleston" conference, Charleston, SC (October 2011)
Multi-mission Archive at Space Telescope (MAST) Users Group (MUG) (July 2009 – September 2011)
Scientific Organizing Committee for "Future Directions in Ultraviolet Spectroscopy" conference, Baltimore, MD (October 2008)
Scientific Organizing Committee for "The Central Engine of AGN" conference, Xian, China (October 2006)
Scientific Organizing Committee for "AGN Winds in the Caribbean" conference, Virgin Islands (November 2005)
NASA's FUSE Observers Advisory Committee (June 2004 – November 2007)
Press Release on "Galactic Bars Feed Supermassive Black Holes" at the American Astronomical Society Meeting, Nashville, TN (26 May 2003)
Co-chair of workshop on "Mass Outflow in AGN", CUA (March 2001)
Central Committee for the International AGN Watch (1988 – 2002)

Honors and Awards
Distinguished University Professor, Georgia State University (2016 – present)
CSC Professional Paper Honorarium Award (1991, 1995, 1997)
NASA Group Achievement Award: HST GHRS Development Team (1991)
NASA Group Achievement Award: IUE Operations (1988)
Lowell Observatory Summer Fellow (1983)

Publications in Refereed Journals

1. "Gemini Near Infrared Field Spectrograph Observations of the Seyfert 2 Galaxy Mrk 573: In Situ Acceleration of Ionized and Molecular Gas Off Fueling Flows", Fischer, T.C., Machuca, C., Diniz, M.R., **Crenshaw, D.M.**, Kraemer, S.B., Riffel, R.A., Schmitt, H.R., Baron, F., Storchi-Bergmann, T., Straughn, A., Revalski, M., & Pope, C.L. 2016, ApJ, 834, 30.

2. "BAT AGN Spectroscopic Survey-III. An Observed Link between AGN Eddington Ratio and Narrow Emission Line Ratios", Oh, K., et al. 2016, MNRAS, 464, 1466.

3. "New Insights into the Spectral Variability and Physical Conditions of the X-Ray Absorbers in NGC 4151", Couto, J.D., Kraemer, S.B., Turner, T.J., & Crenshaw, D.M. 2016, ApJ, 833, 191.

4. "A Reverberation-Based Black Hole Mass for MCG-06-30-15", Bentz, M.C., Cackett, E.M., **Crenshaw, D.M.**, Horne, K., Street, R., & Ou-Yang, B. 2016, ApJ, 830, 136.

5. "Space Telescope and Optical Reverberation Mapping Project. IV. Anomalous Behavior of the Broad Ultraviolet Emission Lines in NGC 5548", Goad, M.R., et al. 2016, ApJ, 824, 11.

6. "Space Telescope and Optical Reverberation Mapping Project. III. Optical Continuum Emission and Broadband Time Delays in NGC 5548", Fausnaugh, M.M. 2016, ApJ, 821, 56.

7. "Feedback from Mass Outflows in Nearby Active Galactic Nuclei. II. Outflows in the Narrow-Line Region of NGC 4151", **Crenshaw, D.M.**, Fischer, T.C., Kraemer, S.B., & Schmitt, H.R. 2015, ApJ, 799, 83.

8. "Intermediate Inclinations of Type 2 Coronal-Line Forest AGN", Rose, M., Elvis, M., **Crenshaw, D.M.**, & Glidden, A., 2015, MNRAS, 451, 11.

9. "Space Telescope and Optical Reverberation Mapping Project. II. Swift and HST Reverberation Mapping of the Accretion Disk of NGC 5548", Edelson, R., et al. 2015, ApJ, 806, 129.

10. "Space Telescope and Optical Reverberation Mapping Project. I. Ultraviolet Observations of the Seyfert 1 Galaxy NGC 5548 with the Cosmic Origins Spectrograph on Hubble Space Telescope", De Rosa, G., Peterson, B.M., Ely, J., Kriss, G.A., **Crenshaw, D.M.**, et al. 2015, ApJ, 806, 128.

11. "A Minor Merger Caught in the Act of Fueling an AGN: The Case of Mrk 509", Fischer, T.C., **Crenshaw, D.M.**, Kraemer, S.B., Schmitt, H.R., Storchi-Bergmann, T., & Riffel, R.A. 2015, ApJ, 799, 234.

12. “Physical Conditions in the X-ray Emission-line Gas in NGC 1068”, Kraemer, S.B., Sharma, N., Turner, T.J., George, I.M., & **Crenshaw, D.M.** 2015, ApJ, 798, 53.

13. “BAT AGN spectroscopic survey-II. X-ray emission and high-ionization optical emission lines”, Berney, S., et al. 2015, MNRAS, 454, 3622.

14. [O III] λ5007 and X-Ray Properties of a Complete Sample of Hard X-Ray Selected AGNs in the Local Universe”, Ueda, Y., et al. 2015, ApJ, 815, 1.

15. “Long-term X-ray Stability and UV Variability of the Ionized Absorption in NGC 3783”, Scott, A.E., Brandt, W.N., Behar, E., **Crenshaw, D.M.,** Gabel, J.R., Gibson, R.R., Kaspi, S., Kraemer, S.B., & Turner, T.J. 2014, ApJ, 797, 105.

16. “Spatially Resolved Spectra of the Teacup Active Galactic Nucleus: Tracing the History of a Dying Quasar”, Gagne, J.P., **Crenshaw, D.M.**, Kraemer, S.B., Schmitt, H.R., Keel, W.C., Rafter, S., Fischer, T.C., Bennert, V.N., & Schawinski, K. 2014, ApJ, 792, 72.

17. “Determining Inclinations of Active Galactic Nuclei via their Narrow-line Region Kinematics. II. Correlation with Observed Properties”, Fischer, T.C., **Crenshaw, D.M.**, Kraemer, S.B., & Schmitt, H.R., & Turner, T.J. 2014, ApJ, 785, 25.

18. “Determining Inclinations of Active Galactic Nuclei via their Narrow-line Region Kinematics. I. Observational Results”, Fischer, T.C., **Crenshaw, D.M.**, Kraemer, S.B., & Schmitt, H.R. 2013, ApJS, 209, 1.

19. “A High Resolution View of the Warm Absorber in the Quasar MR 2251-178”, Reeves, J.N., Porquet, D., Braito, V., Gofford, J., Nardini, E., Turner, T.J., **Crenshaw, D.M.**, & Kraemer, S.B. 2013, ApJ, 776, 99.

20. “Feedback from Mass Outflows in Nearby Active Galactic Nuclei. I. Ultraviolet and X-Ray Absorbers”, **Crenshaw, D.M.** & Kraemer, S.B. 2012, ApJ, 753, 75.

21. “Observations of Outflowing Ultraviolet Absorbers in NGC 4051 with the Cosmic Origins Spectrograph”, Kraemer, S.B., **Crenshaw, D.M.**, Dunn, J.P., Turner, T.J., Lobban, A.P. Miller, L.. Reeves, J.N., Fischer, T.C., & Braito, V. 2012, ApJ, 751, 84.

22. “HST Observations of the Double-Peaked Emission Lines in the Seyfert Galaxy Markarian 78: Mass Outflows from a Single AGN”, Fischer, T.C., **Crenshaw, D.M.**, Kraemer, S.B., Schmitt, H.R., Mushotzky, R.F., & Dunn, J.P. 2011, ApJ, 727, 71.

23. “Radio Properties of Low-Redshift Broad-line Active Galactic Nuclei Including Extended Radio Sources”, Rafter, S.E., **Crenshaw, D.M.,** & Wiita, P.J. 2011, AJ, 141, 85.

24. "Multiwavelength Probes of Obscuration Towards the Narrow Line Regions in Seyfert Galaxies", Kraemer, S.B., Schmitt, H.R., **Crenshaw, D.M.**, Melendez, M., Turner, T.J., Guainazzi, M., & Mushotzky, R.F. 2011, ApJ, 727, 130.

25. "Contemporaneous Chandra HETG and Suzaku X-ray observations of NGC 4051", Lobban, A.P., Reeves, J.N., Miller, L., Turner, T.J., Braito, V., Kraemer, S.B., & **Crenshaw, D.M.** 2011, MNRAS, 414, 1965.

26. "Galactic-scale Absorption Outflow in the Low-luminosity Quasar IRAS F04250-5718: Hubble Space Telescope/Cosmic Origins Spectrograph Observations", Edmonds, D., et al. (including **Crenshaw, D.M.**), 2011, ApJ, 739, 7.

27. "The Geometry of Mass Outflows and Fueling Flows in the Seyfert 2 Galaxy Mrk 3", **Crenshaw, D.M.**, Kraemer, S.B., Schmitt, H.R., Jaffé, Y.L., Deo, R.P., Collins, N.R., & Fischer, T.C. 2010, AJ, 139, 871.

28. "Radial Velocity Offsets Due to Mass Outflows and Extinction in Active Galactic Nuclei", **Crenshaw, D.M.**, Schmitt, H.R., Kraemer, S.B., Mushotzky, R.F., & Dunn, J.P. 2010, ApJ, 708, 419.

29. "A Multiwavelength Study of the Nature of Type 1.8/1.9 Seyfert Galaxies", Trippe, M.L., **Crenshaw, D.M.**, Deo, R.P., Dietrich, M., Kraemer, S.B., Rafter, S.E., & Turner, T.J., 2010, ApJ, 725, 1749.

30. "Modeling the Outflow in the Narrow-line Region of Markarian 573: Biconical Illumination of a Gaseous Disk", Fischer, T.C., **Crenshaw, D.M.,** Kraemer, S.B., Schmitt, H.R., & Trippe, M.L. 2010, AJ, 140, 577.

31. "Physical Conditions in the Ultraviolet Absorbers of IRAS F22456-5125", Dunn, J.P., **Crenshaw, D.M.,** Kraemer, S.B., & Trippe, M.L. 2010, ApJ, 713, 900.

32. "Spectral variability and reverberation time delays in the Suzaku X-ray spectrum of NGC 4051", Miller, L., Turner, T.J., Reeves, J.N., Lobban, A., Kraemer, S.B., & **Crenshaw, D.M.** 2010, MNRAS, 403, 196.

33. "Significant X-ray Line Emission in the 5-6 keV Band of NGC 4051", Turner, T.J., Miller, L., Reeves, J.N., Lobban, A., Braito, V., Kraemer, S.B., & **Crenshaw, D.M.** 2010, ApJ, 712, 209.

34. "Mass Outflow in the Seyfert 1 Galaxy NGC 5548", **Crenshaw, D.M.**, Kraemer, S.B., Schmitt, H.R., Kaastra, J.S., Arav, N., Gabel, J.R., & Korista, K.T. 2009, ApJ, 698, 281.

35. "The Mid-Infrared Continua of Seyfert Galaxies", Deo, R.P., Richards, G.T., **Crenshaw, D.M.**, & Kraemer, S.B. 2009, ApJ, 705, 14.

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151. "Variability of the Emission-Line Spectra and Optical Continua of Seyfert Galaxies. III. Results for a Homogeneous Sample", Peterson, B.M., **Crenshaw, D.M.**, & Meyers, K.A. 1985, ApJ, 298, 283.

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"Mass Outflow in Active Galactic Nuclei", **Crenshaw, D.M.**, Science, 292, 1500 (2001).

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Mass Outflow in Active Galactic Nuclei: New Perspectives, ed. **D.M. Crenshaw**, S.B. Kraemer, & I.M. George, Astronomical Society of the Pacific Conference Series, Vol. 255 (San Francisco: ASP) (2002).

Review Articles

"Mass Loss from the Nuclei of Active Galaxies", **Crenshaw, D.M.**, Kraemer, S.B., & George, I.M., Annual Review of Astronomy and Astrophysics, Vol. 41, 117 (2003)

Refereed Proceedings (since August 2001)

1. "Measuring Feedback in Nearby AGN", **Crenshaw, D.M**., Fischer, T.C., Kraemer, S.B., Schmitt, H.R., & Turner, T.J. 2012, in AGN Winds in Charleston, ASP Conference Series, 460, 261.
2. "AGN Narrow-Line Kinematics: Determining Inclinations via Outflows", Fischer, T.C., **Crenshaw, D.M.,** Kraemer, S.B., Schmitt, H.R., & Turner, T.J. 2012, in AGN Winds in Charleston, ASP Conference Series, 460, 154.
3. "Exploring Micro-Turbulence in Emission and Absorption in AGN", Kraemer, S.B., **Crenshaw, D.M.**, Bottorff, M.C., Turner, T.J., & Miller, L. 2012, in AGN Winds in Charleston, ASP Conference Series, 460, 57.
4. "Mass Outflows in Narrow-Line Seyfert 1 Galaxies", **Crenshaw, D.M.**, Kraemer, S.B., Schmitt, H.R., & Fischer, T.C. 2011, in Narrow-Line Seyfert 1 Galaxies and their Place in the Universe, Proceedings of Science, http://pos.sissa.it/cgi-bin/reader/conf.cgi?confid=126, id. 27
5. "Are Narrow-Line Seyfert 1 Galaxies Viewed Pole-On?", Fischer, T.C., **Crenshaw, D.M**., Kraemer, S.B., & Schmitt, H.R. 2011, in Narrow-Line Seyfert 1 Galaxies and their Place in the Universe, Proceedings of Science, http://pos.sissa.it/cgi-bin/reader/conf.cgi?confid=126, id.50
6. "Velocity Offsets Due to Mass Outflows in Active Galaxies", **Crenshaw, D.M.**, Kraemer, S.B., Schmitt, H.R., Mushotzky, R.F., & Dunn, J.P. 2010, in Co-Evolution of Central Black Holes and Galaxies, Proceedings of the International Astronomical Union, IAU Symposium, 267, 387.
7. "Exploring the Inner Narrow-Line Regions of Seyfert Galaxies", Kraemer, S.B., **Crenshaw, D.M.**, Trippe, M.L., Schmitt, H.R., & Melendez, M. 2010, in Co-Evolution of Central Black Holes and Galaxies, Proceedings of the International Astronomical Union, IAU Symposium, 267, 401.

8. "Using Ark 564 and I Zw 1 as Laboratories for Modeling the Fe II Pseudo-Continuum in QSOs", Eufrasio, R.T., Bruhweiler, F., Verner, E., Wills, B., & **Crenshaw, D.** 2010, in Co-Evolution of Central Black Holes and Galaxies, Proceedings of the International Astronomical Union, IAU Symposium, 267, 260.

9. "Intrinsic Absorbers in Active Galactic Nuclei", Dunn, J.P., **Crenshaw, D.M.**, Arav, N., Bautista, M.A., Kraemer, S.B., & Trippe, M.L. 2009, *in Future Directions in Ultraviolet Spectroscopy*, ed. M.E. Van Steenberg, G. Sonneborn, H.W. Moos, & W.P. Blair, (Melville, NY: American Institute of Physics), AIP Conference Proceedings, 1135, 49.

10. "Mass Outflows from Seyfert Galaxies as Seen in Emission and Absorption", **Crenshaw, D.M.** & Kraemer , S.B. 2007, in *The Central Engine of Active Galactic Nuclei*, ed. L.C. Ho and J.-M. Wang (San Francisco: Astronomical Society of the Pacific), ASP Conference Series, 373, 319.

11. "Spitzer/IRS Observations of Seyfert 1.8 and 1.9 Galaxies: A View Through the Obscuring Torus?", Deo, R.P., **Crenshaw, D.M.**, & Kraemer, S.B. 2007, in *The Central Engine of Active Galactic Nuclei*, ed. L.C. Ho and J.-M. Wang (San Francisco: Astronomical Society of the Pacific), ASP Conference Series, 373, 483.

12. "The Host Galaxies of Narrow-Line Seyfert 1's: Evidence for Bar-Driven Fueling", **Crenshaw, D.M.**, Deo, R., Kraemer, S.B., & Gabel, J.R. 2005, in *The Interplay among Black Holes, Stars, and ISM in Galactic Nuclei*, ed. T. Storchi-Bergmann, L.C. Ho, & H.R. Schmitt (Cambridge: Cambridge University Press), IAU Symposium, 222, 415.

13. "EUV Continuum of Narrow-Line Seyfert 1 Galaxies", Dietrich, M., **Crenshaw, D.M.**, & Kraemer, S.B. 2005, in *The Interplay among Black Holes, Stars, and ISM in Galactic Nuclei*, ed. T. Storchi-Bergmann, L.C. Ho, & H.R. Schmitt (Cambridge: Cambridge University Press), IAU Symposium, 222, 87.

14. "Combined HST/STIS, FUSE, and Chandra Observations of the Seyfert 1 Galaxy NGC 4151", Kraemer, S.B., **Crenshaw, D.M.**, Gabel, J.R., & George, I.M. 2005, in *The Interplay among Black Holes, Stars, and ISM in Galactic Nuclei*, ed. T. Storchi-Bergmann, L.C. Ho, & H.R. Schmitt (Cambridge: Cambridge University Press), IAU Symposium, 222, 275.

15. "Kinematic Constraints on UV and X-ray Absorbers in Seyfert 1 Galaxies", **Crenshaw, D.M.**, Kraemer, S.B., & Gabel, J.R. 2004, in *AGN Physics with the Sloan Digital Sky Survey*, ed. G.T. Richards & P.B. Hall (San Francisco: Astronomical Society of the Pacific), ASP Conference Series, 311, 235 - 238.

16. "Constraints on Intrinsic UV Absorption in NGC 3783", Gabel, J.R., Kraemer, S.B., & **Crenshaw, D.M.** 2004, in *AGN Physics with the Sloan Digital Sky Survey*, ed.

G.T. Richards & P.B. Hall (San Francisco: Astronomical Society of the Pacific), ASP Conference Series, 311, 239 - 242.

17. "Intrinsic UV Absorption and Reddening in Seyfert Galaxies", **Crenshaw, D.M.** & Kraemer, S.B. 2003, in *Active Galactic Nuclei: From Central Engine to Host Galaxy*, ed. S. Collin, F. Combes, & I. Shlosman (San Francisco: Astronomical Society of the Pacific), ASP Conference Series, 290, 195.

18. "Intrinsic UV Absorption in the Seyfert 1 Galaxy NGC 3783: FUSE and HST/STIS Results", Gabel, J.R., Kraemer, S.B., & **Crenshaw, D.M.** 2003, in *Active Galactic Nuclei: From Central Engine to Host Galaxy*, ed. S. Collin, F. Combes, & I. Shlosman (San Francisco: Astronomical Society of the Pacific), ASP Conference Series, 290, 1205.

19. "One Week with Chandra: A Long Look at NGC 5548", Kaastra, J.S., Steenbrugge, K.C., Brinkman, A.C., **Crenshaw, D.M.**, Kraemer, S.B., Paerels, F.B.S., Liedahl, D.A., George, I.M., Turner, T.J., & Yaqoob, T. 2003, in *Active Galactic Nuclei: From Central Engine to Host Galaxy*, ed. S. Collin, F. Combes, & I. Shlosman (San Francisco: Astronomical Society of the Pacific), ASP Conference Series, 290, 101.

20. "Variable UV Absorption in NGC 3783 and NGC 4151"', **Crenshaw, D.M.**, Kraemer, S.B., & Gabel, J.R. 2002, in *Mass Outflow in Active Galactic Nuclei: New Perspectives*, ed. D.M. Crenshaw, S.B. Kraemer, & I.M. George (San Francisco: Astronomical Society of the Pacific), ASP Conference Series, 255, 87.

21. "The Physical Conditions in the UV Absorbers in the Seyfert 1 Galaxy NGC 3783", Gabel, J.R., Kraemer, S.B., & **Crenshaw, D.M.** 2002, in *Mass Outflow in Active Galactic Nuclei: New Perspectives*, ed. D.M. Crenshaw, S.B. Kraemer, & I.M. George (San Francisco: Astronomical Society of the Pacific), ASP Conference Series, 255, 81.

22. "Physical Conditions in the UV Absorbers in NGC 4151", Kraemer, S.B., **Crenshaw, D.M.**, Hutchings, J.B., George, I.M., Gull, T.R., Kaiser, M.E., Nelson, C.H., & Weistrop, D. 2002, in *Mass Outflow in Active Galactic Nuclei: New Perspectives*, ed. D.M. Crenshaw, S.B. Kraemer, & I.M. George (San Francisco: Astronomical Society of the Pacific), ASP Conference Series, 255, 93.

23. Ionization Equilibrium and Chemical Abundances in BALQSO PG 0946+301", Arav, N., de Kool, M., Korista, K.T., & **Crenshaw, D.M.** 2002, in *Mass Outflow in Active Galactic Nuclei: New Perspectives*, ed. D.M. Crenshaw, S.B. Kraemer, & I.M. George (San Francisco: Astronomical Society of the Pacific), ASP Conference Series, 255, 179.

24. "HST/STIS Spectra of PG 0946+301: Spanning 1000 Å in the UV Rest Frame of a BALQSO", Korista, K.T., Arav, N., de Kool, M., & **Crenshaw, D.M.** 2002, in *Mass Outflow in Active Galactic Nuclei: New Perspectives*, ed. D.M. Crenshaw, S.B. Kraemer, & I.M. George (San Francisco: Astronomical Society of the Pacific), ASP Conference Series, 255, 201.

25. "Kinematics of the NLR in Mrk 3", Ruiz, J.R., **Crenshaw, D.M.**, & Kraemer, S.B. 2002, in *Mass Outflow in Active Galactic Nuclei: New Perspectives*, ed. D.M. Crenshaw, S.B. Kraemer, & I.M. George (San Francisco: Astronomical Society of the Pacific), ASP Conference Series, 255, 221.

26. "Variability of the Intrinsic UV Absorption Lines in Seyfert Galaxies", **Crenshaw, D.M.**, & Kraemer, S.B. 2001, in *Probing the Physics of Active Galactic Nuclei by Multiwavelength Monitoring*, ed. B.M. Peterson, R.S. Polidan, & R.W. Pogge (San Francisco: Astronomical Society of the Pacific), ASP Conference Series, 224, 285.

Invited Talks (since August 2001)

1. "Feedback in the Narrow-Line Regions of Nearby AGN", Black Hole Accretion and Feedback Conference, Shanghai, China, (June 2015)

2. "Quantifying the Impact of Outflows in the Inner Regions of AGN", Conference on The Inner Regions of Quasars, Austin, TX (September 2014)

3. "The Importance of Mass Outflows for AGN Feedback", International Conference on Black Holes, Jets, and Outflows", Kathmandu, Nepal (October 2013)

4. "The Importance of Mass Outflows for AGN Feedback", University of Florida Astronomy Department Colloquium (March 2013)

5. "Quantifying Feedback in Nearby AGN", Energetic Astronomy Conference, Annapolis, MD (June 2012)

6. "AGN and their Connections to the Outflow Phenomenon", ALMA/NAASC 2012 Workshop: Outflows, Winds and Jets, Charlottesville, VA (March 2012)

7. "Observations of Active Galactic Nuclei" (10 lectures), in the Beijing International Summer School on "The Physics and Evolution of AGN", Beijing, China, (September 2011)

8. "FUV NALS, BALS, and their Kinematics", High Energy View of Accreting Objects: AGN and X-ray Binaries" conference, Agios Nikolaos, Crete, Greece (October 2010)

9. "Mass Outflows in Active Galactic Nuclei", Department of Physics, Virginia Tech, Blacksburg, VA (September 2008)

10. "X-ray Grating Spectroscopy of Active Galactic Nuclei", X-ray Grating Spectroscopy Workshop, Boston, MA (July 2007)

11. “UV and X-ray Warm Absorbers in Seyfert Galaxies”, The Central Engine of Active Galactic Nuclei conference, Xian, China (October 2006)

12. “Mass Outflows from AGN in Emission and Absorption”, Active Galactic Nuclei: from Atoms to Black Holes conference, Tel Aviv, Israel (February 2006)

13. “Seyfert Galaxy Outflows in Emission and Absorption”, AGN Winds in the Caribbean conference, St. John, Virgin Islands (November 2005)

14. “Mass Outflow from the Nuclei of Active Galaxies'” Department of Physics and Astronomy, University of Oklahoma, Norman, OK (October 2005)

15. “The Connection Between Mass Outflow and the Narrow-Line Region in Seyfert Galaxies”, Center for Astrophysics and Space Astronomy, University of Colorado, Boulder, CO (May 2005)

16. “Mass Outflow from Active Galaxies”, Department of Physics and Astronomy, University of Alabama, Tuscaloosa, AL (April 2005)

17. “Mass Outflow from the Nuclei of Active Galaxies”, Department of Physics and Astronomy, University of Kentucky, Lexington, KY (February 2005)

18. “Mass Outflow from the Nucleus of the Seyfert 1 Galaxy NGC 3783”, Department of Astronomy, The Ohio State University, Columbus, OH (April 2004)

19. “High Spatial Resolution Spectroscopy of Nearby AGN with HST”, The Structure and Composition of Active Galactic Nuclei: Optical Interferometry and Adaptive Optics of NGC 1068, workshop at the Lorentz Center, Leiden, The Netherlands (January 2004)

20. “HST and FUSE Spectroscopy of Photoionized Gas in Active Galactic Nuclei”, Frontiers in Laboratory Astrophysics workshop, Athens, GA (June 2003)

21. “Intrinsic UV Absorption and Reddening in Seyfert 1 Galaxies”, Space Telescope Science Institute, Baltimore, MD (December 2002)

22. “Mass Outflow in the Seyfert 1 Galaxy NGC 4151” Department of Astronomy, University of Florida, Gainesville, FL (September 2001)

Contributed Presentations (since August 2001)

1. “Feeding and Feedback in Nearby AGN based on IFU Observations”, **Crenshaw, D.M.**, Fischer, Travis C., Kraemer, S.B., Schmitt, H.R., Pope, C.L., Machuca, C., & Revalski, M., American Astronomical Society, Kissimmee, FL, January 2016.
2. “Do QSO2s have Narrow Line Region Outflows? Implications for Quasar-mode Feedback. Imaging Results”, Kraemer, S.B., Longo Micchi, L.F., Schmitt, H.R.,

Fischer, T.C.;, & **Crenshaw, D.M.**, American Astronomical Society, Kissimmee, FL, January 2016.

3. "Do QSO2s have Narrow Line Region Outflows? Implications for quasar-mode feedback. Spectroscopic Results", Fischer, T.C., Kraemer, S.B., **Crenshaw, D. M.**, Schmitt, H.R., American Astronomical Society, Kissimmee, FL, January 2016.
4. "New Chandra Observations of NGC 4151: Modelling the X-Ray Absorption", Denes Couto, J., Kraemer, S.B., Turner, T.J., & **Crenshaw, D.M**., American Astronomical Society, Kissimmee, FL, January 2016.
5. "Kinematic and Physical Constraints on the Outflows in NGC 3516", Dunn, J.P., Parvaresh, R., **Crenshaw, D.M.**, Kraemer, S.B., & Gabel, J.R. American Astronomical Society, Kissimmee, FL, January 2016.
6. "Mass Outflow in the Narrow Line Region of Markarian 573", Revalski, M., **Crenshaw, D.M.**, Fischer, T.C., Kraemer, S.B., & Schmitt, H.R., American Astronomical Society, Kissimmee, FL, January 2016.
7. "Modeling Host Disk Kinematics of Nearby Active Galactic Nuclei", Machuca, C., **Crenshaw, D.M.**, & Fischer, T.C., American Astronomical Society, Kissimmee, FL, January 2016.
8. "The Effect of Special Reduction Procedures of IFU Observations from Gemini-NIFS on Dynamical Measurements of Nearby AGN", Pope, C.L., **Crenshaw, D.M.**, & Fischer, T.C., American Astronomical Society, Kissimmee, FL, January 2016.
9. "Investigating a Correlation Between Mid-IR Color and Inclination in Active Galactic Nuclei", **Crenshaw, D.M.,** Rose, M., Elvis, M., Glidden, A., & Fischer, T., IAU General Assembly, Meeting #29, Honolulu, HW, August 2015.
10. "Automated IFU Analysis: Narrow Line Region Outflows In Mrk 3", Fischer, T.C., **Crenshaw, D.M.**, & Pope, C., IAU General Assembly, Meeting #29, Honolulu, HW, August 2015.
11. "Investigating a Correlation Between AGN Inclination and Mid-IR Color", **Crenshaw, D. M.,** Fischer, T.C., Kraemer, S.B., & Schmitt, American Astronomical Society, Seattle, WA, January 2015.
12. "Determining the Narrow-Line Region Geometry of Mrk 3 with Gemini/NIFS", Pope, C.L, Fischer, T.C., & **Crenshaw, D.M.**, American Astronomical Society, Seattle, WA, January 2015.
13. "An Extended Look at the Narrow-Line Region Kinematics of Markarian 573", Machuca, C., Fischer, T.C., & **Crenshaw, D.M.**, American Astronomical Society, Seattle, WA, January 2015.
14. "Bayesian Model Selection in 'Big Data' Spectral Analysis", Fischer, T.C., **Crenshaw, D.M.**, Baron, F., Kloppenborg, B.K., & Pope, C.L., American Astronomical Society, Seattle, WA, January 2015.

15. “Variability in the Intrinsic UV Absorption in Mrk 279 based on HST/COS Spectra”, Schmachtenberger, B.R.; Gabel, J., **Crenshaw, D.M.,** & Kraemer, S.B., American Astronomical Society, Seattle, WA, January 2015.

16. “AGN Winds and their Importance for Feedback”, Crenshaw, D.M. 2014, **Crenshaw, D.M.**, Science with the *Hubble Space Telescope* IV: Looking to the Future, Rome, Italy, March 2014.

17. “The Importance of Winds for AGN Feedback”, **Crenshaw, D.M.,** Kraemer, S.B., Schmitt, H.R., Fischer, T.C., & Gagne, J, American Astronomical Society, Washington, DC., January 2014.

18. “Deconvolving Contributions to the Narrow Emission-Line Spectra of Narrow-Line Seyfert 1s”, Kraemer, S.B., **Crenshaw, D.M.,** Schmitt, H.R., & Dietrich, M., American Astronomical Society, Washington, DC., January 2014.

19. Variability in the Intrinsic Absorption in the Seyfert 1 Galaxy NGC 378, Gabel, J.R., **Crenshaw, D.M.,** Dunn, J.P., & Kraemer, S.B., American Astronomical Society, Washington, DC., January 2014.

20. “Check This Out: A Minor Merger in Mrk 509?”, Fischer, T.C., **Crenshaw, D.M.,** Kraemer, S.B., Schmitt, H.R., Storchi-Bergmann, T., & Riffel, R.A, American Astronomical Society, Washington, DC., January 2014.

21. “Determining Nearby AGN Inclinations via Gemini/NIFS IFU Spectroscopy”, Fischer, Travis C., **Crenshaw, D.M**., Kraemer, S.B., Schmitt, H.R., Storchi-Bergmann, T., & Riffel, R. 2013, American Astronomical Society, Long Beach, CA, January 2013.

22. “Measuring Feedback from Mass Outflows of Ionized Gas in Nearby AGN”, **Crenshaw, D.M.**, Kraemer, S.B., Schmitt, H.R., Turner, J., Fischer, T.C. 2013, American Astronomical Society, Long Beach, CA, January 2013.

23. “The Structure and Energetics of AGN Winds**”, Crenshaw, D.M**. 2012, American Astronomical Society, Austin, TX, January 2012.

24. “Black Hole Masses and Eddington Ratios in a Large Sample of Active Galactic Nuclei”, Michel, A. & **Crenshaw, D.M**. 2012, American Astronomical Society, Austin, TX, January 2012.

25. “Measuring Feedback in Nearby AGN”, **Crenshaw, D.M.** 2011, AGN Winds in Charleston conference, Charleston, SC, October 2011.

26. “Mass Outflows in Narrow-Line Seyfert 1 Galaxies”, **Crenshaw, D.M.** 2011, Narrow-Line Seyfert 1 Galaxies and their place in the Universe” conference, Milan, Italy, April 2011.

27. “Determining AGN Feedback Parameters from Seyfert Galaxy Outflows”, **Crenshaw, D.M.**, Kraemer, S.B., Schmitt, H.R., & Fischer, T.C. 2011, American Astronomical Society, Seattle, WA, January 2011.

28. “Double-Peaked Emission Lines in the Seyfert Galaxy Markarian 78: Mass Outflows from a Single AGN”, Fischer, T.C., **Crenshaw, D.M.**, Kraemer, S.B., & Schmitt, H.R. 2011, American Astronomical Society, Seattle, WA, January 2011.

29. “Optical Spectra of the Teacup AGN”, Gagne, J., **Crenshaw, D.M.**, Keel, W.C., & Fischer, T.C. 2011, American Astronomical Society, Seattle, WA, January 2011.

30. “Multi-wavelength Probes of Obscuration Towards the Narrow Line Region in Seyfert Galaxies”, Kraemer, S.B., Schmitt, H., **Crenshaw, D.M**., Melendez, M., Turner, J., Guainazzi, M., & Mushotzky, R. 2011, American Astronomical Society, Seattle, WA, January 2011.

31. “X-ray and Optical Observations of Naked Seyfert 2 Galaxies”, **Crenshaw, D.M.**, Trippe, M., Kraemer, S., and Turner, J. 2010, High Energy Astrophysics Division, Waikoloa, Hawaii, March 2010.

32. The Disribution of X-ray Column Densities in Seyfert 1.8 and 1.9 Galaxies”, Trippe, M.L., **Crenshaw, D.**, Kraemer, S., & Turner, J. 2010, High Energy Astrophysics Division, Waikoloa, Hawaii, March 2010.

33. “Revealing the Innermost Regions of AGN Through Deep Chandra and Suzaku Observations of NGC 4051”, Reeves, J.T., Turner, J., Miller, L., Lobban, A., Braito, V., Kraemer, S., & **Crenshaw, D.** 2010, High Energy Astrophysics Division, Waikoloa, Hawaii, March 2010.

34. “Outflows and Fueling Flows in the Seyfert 1 Galaxy Mrk 3”, **Crenshaw, D.M.**, Kraemer, S., Schmitt, H., Jaffe, Y., Deo, R., Collins, N., & Fischer, T., American Astronomical Society, Washington, DC, January 2010.

35. “Kinematic Modeling of Mrk 573: Biconical Outflow”, Fischer, T.C., **Crenshaw, D.M.,** Kraemer, S.B., Schmitt, H.R., & Trippe, M.L., American Astronomical Society, Washington, DC, January 2010.

36. “Exploring the Inner Narrow-Line Regions of Seyfert Galaxies”, Kraemer, S.B., **Crenshaw, D.M.**, Schmitt, H.R., Trippe, M.L., & Melendez, M., & Fischer, T.C., American Astronomical Society, Washington, DC, January 2010.

37. “The Relative Contributions of the Fe II Pseudo-Continuum in the Narrow-Lined Type 1 Seyferts Ark 564 and I Zw 1”, Eufrasio, R.T., Bruhweiler, F.C., Verner, E., Wills, B., and **Crenshaw, M**., American Astronomical Society, Washington, DC, January 2010.

38. “Velocity Offsets and Outflows in Seyfert Galaxies”. **Crenshaw, D.M.,** Mulit-Messenger Relativistic Astrophysics Conference, Georgia Tech, Atlanta, May 2009.

39. “Mass Outflows from AGN in Emission and Absorption”, **Crenshaw, D.M.** & Kraemer, S.B., American Astronomical Society, Austin, TX, 7 – 11 January 2008.

40. “Extreme Long-Term Variability in the Optical Spectrum of the Seyfert Galaxy NGC 2992”, Trippe, M.L. & **Crenshaw, D.M.,** American Astronomical Society, Austin, TX, 7 – 11 January 2008.

41. “Radio Loudness Of Broad Line AGN In The SDSS And First Survey”, Rafter, S.E. & **Crenshaw, D.M**., American Astronomical Society, Austin, TX, 7 – 11 January 2008.

42. “Decomposition Of Seyfert Mid-IR Spectra: The Starburst And The Active Nucleus”, Deo, R.P., **Crenshaw, D.M.,** & Kraemer, S.B., American Astronomical Society, Austin, TX, 7 – 11 January 2008.

43. “Probing The Properties Of The Obscuring Material Around the Nucleus Of NGC 4151”, Kraemer, S.B., Schmitt, H.R., & **Crenshaw, D.M.,** American Astronomical Society, Austin, TX, 7 – 11 January 2008.

44. The Correlation Between [O IV] λ25.89μ and the Hard X-ray Luminosities for a Sample of Nearby Seyfert Galaxies, Melendez, M., Kraemer, S.B., Deo, R.P., **Crenshaw, M.,** Schmitt, H.R., Mushotzky, R.F., Tueller, J., Markwardt, C.B., & Winter, L.**,** American Astronomical Society, Austin, TX, 7 – 11 January 2008.

45. “FUSE Analysis of Intrinsic Absorption in NGC 3516”, Dunn, J.P**., Crenshaw, D.M**., & Kraemer, S.B. 2006, American Astronomical Society, Calgary, Alberta, 4 – 8 June 2006.

46. “High-Resolution X-ray and UV Spectra of the Seyfert 1 galaxy NGC 4151. II. STIS and FUSE Observations of the Intrinsic UV Absorption”, **Crenshaw, D.M.**, Kraemer, S.B., & Gabel, J.R., American Astronomical Society, Washington, DC, 8 – 12 January 2006, poster.

47. “High-Resolution X-ray and UV Spectra of the Seyfert 1 galaxy NGC 4151. I. Physical Conditions in the X-ray Absorbers”, Kraemer, S.B., **Crenshaw, D.M.**, George, I.M., & Gabel, J.R., American Astronomical Society, Washington, DC, 8 – 12 January 2006, poster.

48. “Spitzer/IRS Observations of Seyfert 1.8 and 1.9 Galaxies”, Deo, R.P., **Crenshaw, D.M.**, & Kraemer, S.B., American Astronomical Society, Washington, DC, 8 – 12 January 2006, poster.

49. “A Photoionization Model of the Markarian 3 Narrow Line Region”, Collins, N.R., Kraemer, S.B., & **Crenshaw, D.M.**, American Astronomical Society, Washington, DC, 8 – 12 January 2006, poster

50. “Radial Outflows from the Narrow-Line Regions of Seyfert Galaxies: No Evidence for Jet Acceleration”, Das, V., & **Crenshaw, D.M.**, AGN Winds in the Caribbean, St. John, Virgin Islands, 28 November – 2 December 2005, poster.

51. “The Connection Between Outflowing UV Absorbers and the Inner Narrow-Line Region in Seyfert Galaxies”, **Crenshaw, D.M.** & Kraemer, S.B., American Astronomical Society, Minnesota, 29 May – 2 June 2005, poster.

52. “Kinematic Modeling of the NLR of NGC 1068”, Das, V., **Crenshaw, D.M.**, & Kraemer, S.B., American Astronomical Society, Minnesota, 29 May – 2 June 2005, poster.

53. “Dust Morphology of Narrow-Line Seyfert 1 Galaxies”, Deo, R.P., **Crenshaw, D.M.**, & Kraemer, S.B., American Astronomical Society, Minnesota, 29 May – 2 June 2005, poster.

54. “Intrinsic Absorption in the Dwarf Seyfert NGC 4395”, **Crenshaw, D.M.**, Kraemer, S.B., & Gabel, J.R. 2004, American Astronomical Society, Atlanta, 4 - 8 January 2004, poster.

55. “Emission-Line Properties of Active Galctic Nuclei from a Post-COSTAR HST Spectral Atlas”, Kurasczkiewizc, J., Green, P.J., **Crenshaw, D.M.**, Dunn, J., Forster, K., Vestergaard, M., & Aldcroft, T.L. 2004, American Astronomical Society, Atlanta, 4 - 8 January 2004, poster.

56. “Ultraviolet Lightcurve Internet Database of Active Galactic Nuclei”, Dunn, J., **Crenshaw, D.M.**, Jackson, B. 2004, American Astronomical Society, Atlanta, 4 - 8 January 2004, poster.

57. “Mapping the Kinematics of the Narrow-Line Regions in NGC 4151 and NGC 1068”, Das, V. & **Crenshaw, D.M.** 2004, American Astronomical Society, Atlanta, 4 - 8 January 2004, poster.

58. “Probing the Circumnuclear Geometry of Three Seyfert Galaxies”, Deo, R.P., & **Crenshaw, D.M.** 2004, American Astronomical Society, Atlanta, 4 - 8 January 2004, poster.

59. “The EUV Continuum Shape and Strength of NLS1 Galaxies”, Dietrich, M., **Crenshaw, D.M.**, & Kraemer, S.B. 2004, American Astronomical Society, Atlanta, 4 - 8 January 2004, contributed poster.

60. “Optical and IR Variability Study of ESO141-G55 and IRAS09149-6206”, Tomovic, T., Dietrich, M., & **Crenshaw, D.M.** 2004, American Astronomical Society, Atlanta, 4 - 8 January 2004, poster.

61. “Combined HST/STIS, FUSE, and Chandra Observations of the Seyfert 1 Galaxy NGC 4151”, Kraemer, S.B., **Crenshaw, D.M.**, Gabel, J.R., & George, I.M. 2004, American Astronomical Society, Atlanta, 4 - 8 January 2004, poster.

62. “The Connection Between Mass Outflow and the Narrow-Line Region in Seyfert Galaxies”, **Crenshaw, D.M.**, et al., The 2004 Ringburg Castle Workshop on AGN Physics, Germany, November 2004, talk.

63. “Mass Outflow from the Nucleus of the Seyfert 1 Galaxy NGC 3783”, **Crenshaw, D.M.**, et al., High Energy Astrophysics Division Meeting, New Orleans, 8 – 11 September 2004, talk.

64. "Mapping the Kinematics of the Narrow-Line Region in NGC 4151", Das, V.D. & **Crenshaw, D.M.**, American Astronomical Society, Nashville, 26 – 29 June 2003, poster.

65. "Relative Orientations of Seyfert Mass Outflows and Associated Galactic Disks", Deo, R.P. & **Crenshaw, D.M.**, American Astronomical Society, Nashville, 26 – 29 June 2003, poster.

66. "The Host Galaxies of Narrow-Line Seyfert 1 Galaxies: Evidence for Bar-Driven Fueling", **Crenshaw, D.M.** & Kraemer, S.B., American Astronomical Society, 26 – 29 June 2003,Nashville, talk.

67. "Intrinsic Absorption and Reddening in Seyfert 1 Galaxies", **Crenshaw, D.M.**, & Kraemer, S.B., American Astronomical Society, Washington, DC, 7 – 10 January 2002, poster.

68. "Variable Intrinsic UV Absorption in the Seyfert 1.5 Galaxy NGC 3516", Kraemer, S.B., **Crenshaw, D.M.**, George, I.M., Netzer, H., & Turner, T.J., American Astronomical Society, Washington, DC, 7 – 10 January 2002, poster.

69. "HST/STIS and FUSE Observations of the UV Intrinsic Absorption in NGC 3783", Gabel, J.R., **Crenshaw, D.M.**, & Kraemer, S.B., American Astronomical Society, Washington, DC, 7 – 10 January 2002, poster.

70. "Physical Conditions of the Narrow Line Region in Markarian 3", Collins, N.R., Kraemer, S.B., **Crenshaw, D.M.**, & Ruiz, J.R., American Astronomical Society, Washington, DC, 7 – 10 January 2002, poster.

71. "A Kinematic Study of the NLR gas in 10 Seyfert galaxies: Early Results", Ruiz, J.R., **Crenshaw, D.M.**, Kraemer, S.B., Bower, G.A., Gull, T.R., Hutchings, J.B., Kaiser, M.E., & Weistrop, D., American Astronomical Society, Washington, DC, 7 – 10 January 2002, poster.

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a) Education

- Ph.D. in Physics, University of Kansas, Lawrence, Kansas, USA, 5/2000
- M.S. in Computational Physics (Honors), University of Kansas, Lawrence, 5/1999
- M.S. in Physics, Tribhuvan University, Nepal, 6/1994
- B.S. in Physics, Tribhuvan University, Nepal, 6/1991

b) Professional Credentials

Appointments

- **Associate Professor with Tenure, Department of Physics & Astronomy, GSU, Atlanta, USA, 7/2013 - present**
- Associate Member, Neuroscience Institute, GSU, Atlanta, USA, 8/2008 - present
- Associate Member, Center for Behavioral Neuroscience, GSU, Atlanta, 10/2007 - present
- Assistant Professor, Department of Physics & Astronomy, GSU, Atlanta, USA, 7/2007 – 6/2013
- Research Assistant Scientist, Department of Biomedical Engineering , University of Florida, Gainesville, Florida, 11/2004 – 6/2007
- Postdoctoral Research Associate/Adjunct Teaching Faculty Member, Center for Complex Systems & Brain Sciences/Physics Department, Florida Atlantic University, Boca Raton, Florida, 8/2002 - 9/2004
- Postdoctoral Fellow, Georgia Institute of Technology School of Physics & Emory University School of Medicine, Atlanta, Georgia, 5/2000 - 8/2002
- Visiting Research Assistant, Department of Mathematics and Center for Systems Science and Engineering, Arizona State University, Tempe, Arizona, 8/1999 - 5/2000
- Research Assistant, Department of Physics and Astronomy, University of Kansas, 1/1998 - 7/1999
- Head Teaching Assistant, Department of Physics and Astronomy, University of Kansas, 8/1997 - 12/1998
- Teaching Assistant, Department of Physics and Astronomy, University of Kansas, 8/1996 - 7/1997
- Asst. Lecturer, Physics Department, Institute of Engineering, Tribhuvan University, Nepal, 7/1994 - 7/1996

c) Scholarship and Professional Development

Summary

- 50+ publications including 3 Physical Review Letters, 2 Journal of Neuroscience, 6 NeuroImage papers, majority of the publications highlighted/featured, and 40+ invited talks since 2007.
- As of 01/18/2017, according to www.scholar.google.com, citation h-index = 19, i10-index = 31, total citations = 2405, and 435 citations for the paper: "Enhancement of neural synchrony by time delay", M. Dhamala et al., Physical Review Letters, 92, 74104 1- 4 (2004).
- Obtained ~$600,000 in external funding (National Science Foundation Faculty Early Career Development Award for 5 years and Department of Veterans Affairs Grant Award for 3 years) as Principal Investigator to establish neurophysics and neuroimaging research programs at Georgia State University
- Editorial Board Member for scientific journals: Nature Scientific Reports (Biological Physics Section), Webmed Central Plus, Open Journal of Medical Imaging, SM Journal of Neurology and Neuroscience, SciTz Neurology and Neurosciences
- Reviewer + Panelist for National Science Foundation, Reviewer for Austrian Science Fund, Fonds Wetenschappelijk Onderzoek (FWO) and for 50+ scientific journals including PRL, JN, NeuroImage
- Member of American Physical Society, Society for Neuroscience, and Organization for Human Brain Mapping

Awards and Honor

- Organizing Committee Chair for BrainModes 2015
- Host of Citizens United for Research in Epilepsy (CURE) Frontiers Seminar at GSU, 2015
- GSU Arts and Science's Laboratory Safety Award, 2013
- National Science Foundation Faculty Early Career Development Award, 2010
- Elected to Marquis Who's Who in America, 2010
- M. S. in Computational Physics with Honors, 1999
- Member, Physics Honor Society ΣΠΣ, inducted 1998

Funded Grant Proposals as PI while at Georgia State University:

External

- **Title**: BrainModes 2015: Course and Workshop (PI: **Dhamala**). Source: MagVenture, BrainProducts. **Award Amount**: $3,000.
- **Title**: CURE's 2015 Frontiers in Research Seminar (PI: **Dhamala**).
  Source: CURE. **Award Amount**: $2,500. **Period Covered**: 10/1/2015 – 12/10/2015.
- **Title**: **Career:** Brain Network Activity During Perceptual Decision-Making (PI: **Dhamala**).
  Source: National Science Foundation (Faculty Early Career Development (CAREER) Program).
  Award Amount: $539,737. **Period Covered**: 9/15/2010 – 8/30/2016.
- **Title**: Simultaneous EEG-fMRI studies. **Source**: Department of Veterans Affairs (PI**: Dhamala**)
  Award Amount: $64,295. **Period Covered**: 10/01/2008 – 9/30/2011.

Internal

- **Title**: Brain Network Activity Changes in Stroke Survivors **Source**: Georgia State Brains and Behavior Program. **Award Amount**: $15,000. **Period Covered:** 7/1/2016 – 6/30/2017.
  (PIs: **M. Dhamala**, Department of Physics and Astronomy; A. Butler, School of Nursing)

- **Title**: BrainModes 2015: Course and Workshop (PI: **Dhamala**). Source: GSU's Physics and Astronomy, College of Arts and Sciences, School of Nursing, University Research Services, Center for Behavioral Neuroscience, Center for Advanced Brain Imaging, Center for Diagnostics and Therapeutics. **Award Amount**: ~$38,000.
- **Title**: The Neural Basis of Musical Improvisation. **Source**: Georgia State Brains and Behavior Program. **Award Amount**: $29,000. **Period Covered:** 7/1/2014 – 6/30/2015.
  (PIs: **M. Dhamala**, Department of Physics and Astronomy; M. Norggard, School of Music)
- **Title**: Developing novel contrast agents for MR imaging of malignant brain tumor. **Source**: Georgia State Brains and Behavior Program. **Award Amount**: $30,000. **Period Covered:** 7/1/2013 – 6/30/2014.
  (PIs: Jenny Yang and Zhrien Liu, Department of Chemistry, GSU; **M. Dhamala**, Department of Physics)
- **Title**: Granger causality to improve localization of seizure onset (PI: **Dhamala**). **Source**: Georgia State Brains and Behavior Program. **Award Amount**: $30,000. **Period Covered:** 7/1/2011 – 6/31/2012.
  (Collaborator: Charles M. Epstein, Department of Neurology, Emory University, Atlanta)
- **Title**: Brain Activity During Perceptual Decision-Making. **Source**: Georgia State and Georgia Tech Advanced Brain Imaging Center Faculty Seed Grant. **Award Amount**: $10,000. **Period Covered**: 1/01/2010-12/24/2010.
- **Title**: Development of Optimized Near-Infrared Brain Imaging System. **Source**: Georgia State Brains and Behavior Program. **Award Amount**: $29,500. **Period Covered:** 7/1/2009 – 6/30/2010. (Co-PI: Unil Perera, Department of Physics and Astronomy, GSU, Atlanta)
- **Title**: Neurobiology of Economic Decision-Making. **Source**: Georgia State Brains and Behavior Program. **Award Amount**: $30,000. **Period Covered:** 7/1/2008 – 6/30/2009. (Co-PI: Sarah Brosnan, Department of Psychology, GSU, Atlanta)
- **Title**: Sensorimotor Networks with Nonparametric Granger Causality. **Source**: Georgia State Research Initiation Award. **Award Amount**: $10,000. **Period Covered:** 7/1/2008 – 6/30/2009.

Pending Grant Proposals:

- **Title**: Accelerating upper limb rehabilitation in stroke patients by engaging synchronous tongue and wrist motion (PIs: Butler (GSU), **Dhamala (GSU),** Ghovanloo (GaTech)). **Source**: Department of Veterans Affairs. **Award Amount**: $ 1,006,687.00. **Period Covered:** 6/1/2017 – 5/31/2021.
- **Title**: Brain network activity changes following stroke and rehabilitative treatments (PIs: Butler (GSU), **Dhamala (GSU)**). **Source**: Department of Veterans Affairs. **Award Amount**: $ 702,832.00. **Period Covered:** 6/1/2017 – 5/31/2021.

Published Journal Articles

1. S. Bajaj, S. Housley, D. Wu, M. Dhamala, G. A. James, A. J. Butler, "Dominance of the unffected hemisphere motor network and its role in the behavior of chronic stroke survivors", Frontiers in Human Neurosc. 10, 650 (2016).
2. B. Adhikari, M. Norgaard, K. Quinn, J. Ampudia, J. Squirek, M. Dhamala, "The brain network underpinning novel melody creation", Brain Connectivity6, 772 - 785 (2016).
3. S. Bajaj, B. Adhikari, K. Friston, M. Dhamala, "Bridging the gap: Dynamic causal modeling and Granger causality analysis of resting state fMRI", Brain Connectivity 6 (8), 652 - 661(2016).

4. G. Chand, B. Lamichhane, M. Dhamala, "Face or house image perception: beta and gamma bands of oscillations in brain networks carry out the decision", Brain Connectivity 6 (8), 621-631 (2016).
5. B. Lamichhane, B. Adhikari, M. Dhamala, "Salience network activity in perceptual decisions", Brain Connectivity 6, 558 -571 (2016).
6. B. Lamichhane, B. Adhikari, M. Dhamala, "The activity in the anterior insulae is modulated by perceptual decision-making difficulty", Neuroscience327, 79 - 94 (2016).
7. G. Chand, M. Dhamala, "The salience network dynamics in perceptual decision-making", NeuroImage 134, 85 -93 (2016).
8. G. Chand, M. Dhamala, "Interactions among the brain default-mode, salience and central-executive networks during perceptual decision-making of moving dots", Brain Connectivity *6*, 249 (2016).
9. B. Lamichhane, M. Dhamala, "Perceptual decision-making difficulty modulates feedforward effective connectivity to the dorsolateral prefrontal cortex", Front. Hum. Neurosci 9, 948, http://dx.doi.org/10.3389/fnhum.2015.00498 (2015).
10. S. Bajaj, A. J. Butler, D. Drake, M. Dhamala, "Brain effective connectivity during motor-imagery and execution following stroke and rehabilitation", NeuroImage: Clinical 8, 572 - 582(2015).
11. S. Bajaj, A. J. Butler, D. Drake, M. Dhamala, " Functional organization and restoration of the brain motor-execution network after stroke and rehabilitation", Frontiers in Human Neurosc. 9, 1 (2015).
12. B. Lamichhane, M. Dhamala, "The salience network and its functional architecture in a perceptual decision: an effective connectivity study", Brain Connectivity 5, 362 - 70 (2015).
13. D. Sabatinelli, L. McTeaque, M. Dhamala, D. Frank, T. Wagner, B. M. Adhikari, "Reduced medial prefrontal-subcortical connectivity in dysphoria: Granger causality analyses of rapid functional MRI", Brain Connectivity 5, 1 - 9 (2015).
14. C. M. Epstein, B. Adhikari, R. Gross, J. Willie, "High-Frequency Granger Causality in Analysis of Intracranial EEG and in Surgical Decision Making", Epilepsia 55, 2038 -2047 (2014).
15. B. Lamichhane, B. Adhikari, S. F. Brosnan, and M. Dhamala, " The neural basis of perceived unfairness in economic exchanges", Brain Connectivity 4, 619 - 30 (2014).
16. D. Sabatinelli, D. W. Frank, M. Dhamala, B. M. Adhikari, X. Li, "The timing and directional connectivity of human frontoparietal and ventral visual networks in emotional scene perception", Neuroscience 277, 229 - 238 (2014).
17. B. Adhikari, K. Sathian, C. Epstein, B. Lamichhane, M. Dhamala, "Oscillatory activity in neocortical networks during tactile discrimination near the limit of spatial acuity", NeuroImage 19, 300-310 (2014).
18. S. Bajaj, D. Drake, A. J. Butler, M. Dhamala, "Oscillatory motor network activity during rest and movement: an fNIR study", Frontiers in Systems Neurosc. 8, 1 (2014).
19. G. Chand and M. Dhamala, "Spectral factorization-based current source density analysis of ongoing neural oscillations", J. Neuro. Methods 224, 58-65 (2014).
20. B. Adhikari, C. Epstein, M. Dhamala, "Localizing epileptic seizure onsets with Granger causality", Physical Review E 88, 030701 (Rapid) (2013).
21. B. Adhikari, K. Quinn, M. Dhamala, "Is brain's inertia for motor movements different for acceleration and deceleration?", PLOS ONE 8, e78055 (2013).
22. B. Adhikari, E. Goshorn, B. Lamichhane, M. Dhamala, "Temporal order judgments of audiovisual events involve network activity between parietal and prefrontal cortices", Brain Connectivity 3, 536-545 (2013).

23. K. Xu, W. Huang, B. Li, M. Dhamala, and Z. Liu, ``Controlling self-sustained spiking activity by adding or removing network link," Europhysics Letters 102, 50002 1-6 (2013).
24. B. Adhikari, E. Goshorn, and M. Dhamala, " Brain connectivity between the temporo-parietal cortex and the dorsolateral prefrontal cortex facilitates temporal order judgment in audio-visual events", Brain Connectivity 3, 386-397 (2013).
25. S. Bajaj, B. Adhikari, B. Lamichhane, and M. Dhamala, "Amygdala mediated feed-forward network activity is enhanced in decision-making of certain emotional facial expressions", Brain Connectivity 3, 386 (2013).
26. S. Bajaj, B. Adhikari and M. Dhamala, "High-frequency network activity flow predicts low-frequency node activity in fMRI BOLD fluctuations", PLOS one 8(5), 364466 (2013).
27. S. Yuri, M. Dhamala, K. Oshima, and M. Hasler, "Cortico-cardio-respiratory network interactions during anesthesia", PLoS One 7(9), e44634 (2012).
28. S. K. Maran, Y. Cao, M. Dhamala, D. Heck, and D. Jaeger, "Behavior related pauses in simple spike activity of mouse Purkinje cells are linked to spike rate modulation", Journal of Neuroscience 32, 8678 (2012).
29. B. Adhikari, A. Prasad, and M. Dhamala, "Time-delay-induced phase-transition to synchrony in coupled bursting neurons", Chaos 21, 023116 (2011). (Highlighted in the journal, among the top most downloaded articles for 3 months).
30. A. Prasad, M. Dhamala, B. Adhikari, and R. Ramaswamy, "Targeted Control of Amplitude Dynamics in Coupled Nonlinear Oscillators", Physical Review E 82, 027201(2010).
31. Xiaoming Liang, M. Dhamala, Liang Zhao, Zonghua Liu, "Phase-disorder-induced double resonance of neuronal activity", Physical Review E 82, 01902 (Rapid) (2010).
32. *A.* Prasad, M. Dhamala, B. Adhikari, and R. Ramaswamy, "Amplitude Death in Nonlinear Oscillators with Nonlinear Coupling", Physical Review E 81, 027201 (2010).
33. X. Liang, M. Tang, M. Dhamala, and Z. Liu, "Phase Synchronization of Inhibitory Bursting Neurons Induced by Distributed Time Delays in Chemical Coupling", Physical Review E 80, 066202 (2009).
34. M. Dhamala, G. Rangarajan, and M. Ding "Analyzing information flow in brain networks with nonparametric Granger causality", NeuroImage 41 , 354-362 (2008).
35. M. Dhamala, G. Rangarajan, and M. Ding, "Estimating Granger causality from Fourier and wavelet transforms of time series data", Physical Review Letters 100, 018701 (2008).
36. M. Dhamala, C. G. Assisi, V. K. Jirsa, and J. A. S. Kelso, "Multisensory integration for timing engages different brain networks", NeuroImage 34, 764 -773 (2007).
37. M. Dhamala, V. K. Jirsa, and M. Ding, "Enhancement of neural synchrony by time delay", Physical Review Letters 92, 074104 1-4 (2004).
38. M. Dhamala, V. K. Jirsa, and M. Ding, "Transitions to synchrony in bursting neurons" Physical Review Letters 92, 028101-1 (2004).
39. M. Dhamala, G. Pagnoni, K. Wiesenfeld, C. F. Zink, M. Martin, and G. S. Berns "Neural correlates of the complexity of rhythmic finger-tapping", NeuroImage 20, 918 (2003).
40. Zink, G. Pagnoni, M. Martin, M. Dhamala, and G. S. Berns, "Human striatal response to salient non-rewarding stimuli", J. Neuroscience 23, 8092 (2003).
41. M. Dhamala and Y.-C. Lai, "The natural measure of nonattracting chaotic sets and its representation by unstable periodic orbits", Int. J. Bifurcat. Chaos 12, 2991-3006 (2002).
42. P. R. Montague, G. S. Berns, S. M. McClure, G. Pagnoni, M. Dhamala, et. al., "Hyperscan: simultaneous fMRI of human interaction", NeuroImage 16, 1159 - 1164 (2002).
43. M. Dhamala, G. Pagnoni, K. Wiesenfeld, and G. S. Berns, "Measurements of brain activity complexity for varying mental loads", Physical Review E 65, 041917 1 - 7 (2002).
44. M. Dhamala and K. Wiesenfeld, "Generalized stability law for Josephson series arrays", Physics Letters A 292, 269-274 (2002).
45. M. Dhamala, Y.-C. Lai, and E. J. Kostelich, "Analyses of transient chaotic time series", Physical Review E 64, 056207 1-9 (2001).

46. M. Dhamala, Y.-C. Lai, and R. Holt, “How often are chaotic transients in spatially extended ecological systems ?”, Physics Letters A 280, 297 - 302 (2001).
47. M. Dhamala, Y.-C. Lai, and E. J. Kostelich, “Detecting unstable periodic orbits from transient chaotic time series”, Physical Review E 61, 6485-6489 (2000).
48. R. Davidchack, Y.-C. Lai, E. Bollt, and M. Dhamala, “Estimating generating partitions of chaotic systems by unstable periodic orbits”, Physical Review E 61, 1353-1356 (2000).
49. M. Dhamala and Y.-C. Lai, “Unstable periodic orbits and the natural measure of nonhyperbolic chaotic saddles”, Physical Review E 60, 6176-6179 (1999).
50. M. Dhamala and Y.-C. Lai, “Controlling transient chaos in deterministic flows with applications to electrical power systems and ecology”, Physical Review E 59, 1646-1655 (1999).

Published Comment, Enclopedia Entry, Book Chapter

1. M. Dhamala, "What is the nature of causality in the brain? - Inherently probabilistic: Comment on "Foundational perspectives on causality in large-scale brain networks" by M. Mannino and S. L. Bressler", Physics of Life Reviews 15, 139-140 (2015).
2. M. Dhamala, “Spectral Interdependency Methods”, Encyclopedia of Computational Neuroscience, Springer-Verlag Berlin Heidelberg, 2014.
3. Y. Chen, M. Dhamala, A. Bollimunta, C. E. Schroeder, and M. Ding, “Current Source Density Analysis of Ongoing Neural Activity: Theory and Application", in Electrophysiological Recording Methods (Edited by Vertes and Stackman, Humana Press), 2010.

Invited Talks

1. High frequency neuronal network oscillations in human epilepsy. BrainModes 2016, Brussels, Belgium, 12/01-02/2016.
2. Delayed neuronal interactions and synchrony in the brain (Plenary Lecture). International conference on Applications of Mathematics to Nonlinear Sciences, Kathmandu, Nepal, 05/26 – 29/2016.
3. The brain network underpinning novel melody creation. Neuroscience Institute Seminar, GSU, 05/20/2016.
4. Delayed neuronal interactions in brain networks. PGSA conference, GSU, 04/01, 2016.
5. Brain network activity in functions and dysfunctions. Aix-Marseille University, France, 03/25/2015.
6. The neural basis of human decision-making. Ghent University Psychology, 4/24/2015.
7. High-frequency neuronal network oscillations in human epilepsy. Geneva Hospital, Switzerland, 03/23/2015.
8. Brain network activity in functions and dysfunctions. EPFL, Switzerland, 03/20/2015.
9. Brain network activity in functions and dysfunctions. EPFL, Switzerland, 03/20/2015.
10. Oscillatory Neuronal Network Activity in Human Brain Functions and Dysfunctions. Kennesaw State University. Analysis and Applied Mathematics Seminar, 4/12/2015.
11. The neural basis of human decision-making. GSU Neuroscience Institute Seminar, 4/3/2015.
12. High-frequency network activity in human epilepsy. Georgia State University Mathematics and Statistics Seminar, 11/20/2014.
13. Applications of Granger causality in neurophysiology. Georgia Tech/Emory Biomedical Engineering and Emory Biology Seminar, 11/07/2014.
14. Brain Oscillatory Network Activity in Functions and Dysfunctions. Georgia State University Mathematics and Statistics Seminar, 4/11/2014.
15. Brain Oscillatory Network Activity in Functions and Dysfunctions. Florida Atlantic University Neuroscience Seminar, 1/21/2014.
16. Brain Network Oscillations in Functions and Dysfunctions. GSU Neuroscience Institute Colloquium, 10/15/2013.

17. Analyzing Brain Data with Granger Causality. GSU/GaTech Center for Advanced Brain Imaging Seminar, 03/04/2013.
18. Cortico-Cardio-Respiratory Network Interactions during Anesthesia. Workshop on Nonlinear Dynamics and Complex Systems, Department of Mathematical Sciences, Kyungpook National University (KNU), Daegu, South Korea, 12/06/2012.
19. Neuronal Interactions and Synchronization in the Brain. Conference on Nonlinear Dynamics and Complex Systems at the National Institute for Mathematical Sciences, Daejeon, South Korea, 12/2/2012 - 12/5/2012.
20. Delayed neuronal interactions in brain networks. Third International Workshop on Chaos, Complexity and Dynamics in Biological Networks, Corsica, France, 5/28/ - 6/02/2012.
21. Patterns of brain activity during decision-making processes. Bio-Imaging Research Center, University of Georgia, Athens, 02/24/2012.
22. Physics of cognition in the human brain. Department of Physics, Mahendra Morang Campus, Tribhuvan University, Nepal, 12/22/2011.
23. Biophysics research and education in the United States of America. Greenland International College, Biratnagar, Nepal, 12/20/2011.
24. Brain dynamics and networks: understanding brain functions and dysfunctions. Central Department of Physics, Tribhuvan University, Nepal, 12/13/2011.
25. Understanding brain functions using MRI techniques. Gateway to Physics Class Tour to GSU/GaTech Center for Advanced Brain Imaging, Atlanta, 11/7/2011.
26. Brain node and network activity in decision-making processes. Department of Physics and Astronomy, Georgia State University, Atlanta, 10/18/2011.
27. (i) Current source density analysis of ongoing neural oscillations: theory to applications. (ii) Parametric and nonparametric Granger causality: applications to neuroscience. Department of Biology, Emory University, Atlanta, 11/5/2010 (two talks).
28. Synchronization of time-delayed coupled bursting neurons. Dynamics of Bursting Neurons, Atlanta, 4/17/2010.
29. Cortico-cardio-respiratory network interactions during anesthesia. Department of Physics, Florida International University, Florida, 10/24/2008.
30. Estimating information flow in dynamic networks with nonparametric Granger causality. Atlanta Computational Neuroscience Workshop, GSU, Atlanta, 4/8/2008.
31. Estimating information flow in brain networks with Granger causality. Connectivity Seminar, Emory University, Atlanta, 4/6/2008.
32. Analyzing information flow in brain networks with nonparametric Granger causality. Department of Physics, Florida Atlantic University, Florida, USA, 02/21/2008.
33. Analyzing information flow in brain networks with nonparametric Granger causality. School of Physics, University of Sydney, Sydney, Australia, 02/8/2008.
34. Granger causality and brain networks from local field potentials. Brains and Behavior Annual Retreat, Georgia State University, Atlanta, GA, 06/12/2007.
35. Nonparametric Granger causality. DIMACS Workshop on Data Mining, Systems Analysis, and Optimization in Neuroscience, UF, Gainesville, FL, 02/15/2007.
36. (i) Transitions to Synchrony in bursting neurons, and (ii) Analyzing brain networks with nonparametric Granger causality. Department of Physics, Georgia State University, Atlanta, GA, 02/20/2007 (two talks).
37. Analysis of directed brain networks with Granger causality. Department of Biomedical Engineering, Tulane University, New Orleans, LA, 02/6/2007.
38. Analyzing information flow with Granger causality. Department of Physics, Iowa State University, Ames, IA, 01/28/2007.
39. Current source density of ongoing oscillations: theory and applications. Department of Biomedical Engineering, Wayne State University, Detroit, MI, 09/12/2006.

40. Current source density analysis of ongoing oscillations. Quantitative Neuroscience/ Neural Engineering Seminar, Biomedical Engineering, UF, Gainesville, FL, 04/7/2006.
41. Phase-based averaging and current source density of spatially distributed ongoing oscillations. DIMACS Workshop on Data Mining, Systems Analysis, and Optimization in Neuroscience, UF, Gainesville, FL, 02/15 - 02/17/2006.
42. Current source density of ongoing oscillations. Department of Mathematics and Statistics, Georgia State University, Atlanta, 02/13/2006.
43. Synchrony of coupled bursting neurons. Department of Physics, Florida Atlantic University, 12/5/2003.

Contributed Talks and Posters (including students' presentations)

1. Society for Neuroscience Annual Meeting, Chicago, 10/17 - 10/21/2015 (2 posters).
2. Society for Music Perception and Cognition Annual Meeting, Vanderbilt University, Nashville, Tennessee, 08/01-05/2015 (1 talk + 1 poster).
3. Organization of Human Brain Mapping Meeting, Hawaii, 06/14 – 06/18/2015 (1 poster)
4. Society for Neuroscience Annual Meeting, Washington DC, 11/09 - 11/13/2014 (3 posters).
5. Society for Neuroscience Annual Meeting, San Diego, 11/09 - 11/13/2013 (2 posters).
6. Computational Neuroscience Society Workshop: Network Neurosciences, Paris, France, July 17-18, 2013.
7. Society for Neuroscience Annual Meeting, New Orleans, October 13-17, 2012 (3 posters).
8. Statistical Analysis of Neuronal Data, Pittsburgh, 05/31 - 06/02/2012. (3 posters)
9. Society for Neuroscience Annual Meeting, Washington DC, 11/12 - 11/16/2011 (4 posters).
10. Gordon Conference on Cerebellum in Health and Disease, 08/21 - 08/26/2011.
11. Computational Neuroscience Meeting, Stockholm, Sweden, 07/23 - 07/28/2011.
12. Human Brain Mapping Annual Meeting, Quebec City, Canada, 07/26 -07/30/2011.
13. American Clinical Neurophysiology Society Annual Meeting and Courses, New Orleans, 02/01/2011 - 02/06/2011.
14. Society of Neuroscience Annual Meeting, San Diego, 11/15/2010.
15. South East Nerve Net, Atlanta, 03/7/2010.
16. Statistical Analysis of Neuronal Data, Pittsburgh, 05/22 - 05/25/2010.
17. SESAPS Meeting, Atlanta, 11/14/2009.
18. The Spineless Neuroscience Forum, GSU, 04/10/2009.
19. NIBBL, Neuroscience Institute, GSU, 03/11/2009.
20. Conference on Nonlinear Wave Physics, Nizhny Novgorod, Russia, 07/20/2008.
21. American Physical Society March Meeting, New Orleans, 03/14/2008.
22. Applied Mathematics and Neuroscience Seminar, Mathematics, GSU, 03/7/2008.
23. Society for Neuroscience Conference, San Diego, 11/3 -11/7/2007.
24. Society for Neuroscience Conference, Atlanta, 10/14 - 10/18/2006.
25. Society for Neuroscience Conference, Washington DC, 11/12 - 11/16/2005.
26. Dynamics Days 2004, North Carolina, 01/2 - 01/5/2004.
27. Dynamics Days 2003, Arizona, 01/8 - 01/11/2003.
28. Dynamical Neuroscience, Orlando, 11/1 - 11/2/2002.
29. CCBS, Florida Atlantic University, 10/18/2002.
30. Coordination dynamics 2002, Florida, 05/9 - 05/13/2002.
31. Nonlinear Science Seminar, Georgia Tech, Atlanta, 12/3/2001.
32. Dynamical Neuroscience, San Diego, 11/9 - 11/10/2001.
33. Dynamics Days 2001, North Carolina, 01/3 - 01/6/2001.
34. Nonlinear Science Seminar, Arizona State University, 11/16/1999.
35. The Fifth SIAM Conference on Dynamical Systems, Snowbird, Utah, 05/22 - 05/27/1999.
36. Physics Seminar, University of Kansas, 12/11/1998.
37. D0 Preshower Detector Software Meeting, Fermi Lab, Chicago, 06/20/1997.

Research Publicity

1. ScienceDaily News (2014, 2015, 2016)
2. GSU University Webpage (2012, 2014, 2016).
3. Article published in Chaos selected for journal highlight, virtual journal of biological physics research, and the most downloaded paper in June 2011.
4. Virtual Journal of Biological Physics Research (June 2011, May 2010, October 2009, Dec 2009, Jan and Feb 2004, April 2002).
5. GSU College of Arts and Sciences News (September 2013, Jan 2008).
6. Complexity Digest (Jan 2004, Oct 2003).
7. The Journal of Neuroscience Editorial (Sept 2003).
8. Nature news on hyperscanning (March 2002).

d) Instruction including advising by M. Dhamala

Courses Taught by course titles at Georgia State University since Fall 2007

1. College Physics I (algebra-based undergraduate level physics)
2. College Physics II (algebra-based undergraduate level physics)
3. Principles of Physics I (calculus-based undergraduate level physics)
4. Principles of Physics II (calculus-based undergraduate level physics)
5. Functional Neuroimging (undergraduate and graduate level course)
6. Research Topics in Physics (2007 - 2016)
7. Directed Study in Physics (2007 - 2016)
8. Thesis Research (2007 - 2016)
9. Doctoral Dissertation Research (2009 - 2016)

Postdoctoral fellow/Graduate student advisees and their research topics

1. Bhim Mani Adhikari, 12/01/2014 – 06/30/2016, postdoctoral fellow
2. Otis Smart, 03/01/2013 – 01/30/2015, postdoctoral fellow in a NIH-funded project (PI: Robert Gross, Emory University, School of Medicine, Atlanta).
3. Sushma Ghimire, 2014 – present, graduate student.
4. Tim Jordan, 2014 – present, graduate student.
5. Kiran Dhakal, 2013 – present, MS defended in July 2016, PhD research title: Brain Activity in Musical Improvisation and Creativity.
6. Bhim Adhikari, 2007-2014, MS defended in 2011, PhD defended in spring 2014, title: Brain network activity in brain functions and dysfunctions.
7. Sahil Bajaj, 2009 – 2015, MS defended in May 2013, PhD defended in spring 2015, title: Functional and effective connectivity of the human brain following stroke and recovery. (advisor: M. Dhamlaa, co-advisor: Prof. Andrew Butler, School of Nursing, GSU).
8. Ganesh Chand, 2011- 2015, MS defended in 2013, PhD defended in spring 2015, title: Salience network dynamics in perceptual human decision-making.
9. Seema Dahal, 2014 – 2016, MS defended in 2016, title: Seizure-like Dynamics: Models and Analysis.
10. Bidhan Lamichhane, 2008 – 2015, MS defended in the fall 2012, PhD defended in spring 2015, title: Brain node and network activity in human decision-making.
11. Ellen Wooten, 2011 - 2014, MS defended in the fall of 2013, title: Physics of Migraine Headaches.
12. Greggory Rothmeier (co-advised with Dr. Unil Perera), 2009 – 2012, MS defended in 2012, title: Brain tissue temperature dynamics during functional activity and possibilities for optical measurement techniques.

Undergraduate students trained in M. Dhamala's laboratory

1. Lauren Law, spring 2017 -
2. Mamta Chaudhary, fall 2016 -
3. Kristy Yun, spring 2015 – fall 2016
4. Jenine Ampudia, summer 2013 – fall 2014
5. Justin Squirek, summer 2013 – spring 2015
6. Kristen Quinn, summer 2009, 2013 - 2014
7. Nirosha Perera, summer 2013.
8. Ryan Szczech- biology major, spring 2012- spring 2013.
9. Kenny Lee- physics major, fall 2011
10. Rebecca Roles- physics major, fall 2011
11. Adriana Machado- physics major, fall 2010
12. Kelly Anchors- physics major, 01/2010 - 12/2010, currently a graduate student at Vanderbilt.
13. Eli Goshorn- Brain Fellow, summer 2010, CBN.

MS committee member for graduate students

1. Kiran Dhakal, non-thesis MS defended in 2016 (chair: M. Dhamala)
2. Dilip Chauhan, non-thesis MS defended in 2016
3. Venus Saatchi, non-thesis MS defended in 2014
4. S. Bajaj, non-thesis MS defended in 2013 (chair: M. Dhamala)
5. G. Chand, non-thesis MS defended in 2013 (chair: M. Dhamala)
6. E. Wooten, non-thesis MS defended in 2013 (chair: M. Dhamala)
7. B. Lamichhane, non-thesis MS defended in 2012 (chair: M. Dhamala)
8. G. Rothmeier, MS thesis defended in 2012 (chairs: U. Perera & M. Dhamala)
9. Hiroki Makita, MS thesis defended in 2012
10. B. Adhikari, defended in 2011 (chair: M. Dhamala)
11. A. Acharya, defended in 2011
12. A. N. Ramanayaka, defended in 2011
13. William Barnett, defended in 2009
14. Neranjan S. Edirisinghe, defended in 2009
15. M. Brooks (Department of Mathematics and Statistics, GSU), defended in 2009
16. P. Channell (Department of Mathematics and Statistics, GSU), defended in 2009

PhD committee member for graduate students

- Kiran Dhakal, Sushma Ghimire, Timothy Jordan (Ph. D. in progress, chair: M. Dhamala)
- Venkata R. Chaganti, defended in 2015
- Stephanie Hare (Neuroscience), PhD in progress
- Jennifer Ciarochi (Neuroscience Institute), PhD in progress.
- Ricardo Toscano (Neuroscience Institute), PhD in progress.
- Krishna Pusuluri (Neuroscience Institute), PhD in progress
- Abinashi Dhungel (computer science), defended in 2013
- William Barnett (Neuroscience Institute), defended in 2015
- A. Acharya, defended in 2013
- Travis Fischer, defended in 2012
- Tatiana Malaschenko, defended in 2011
- Neranjan S. Edirisinghe, defended in 2010

Courses Developed/Taught

- Phys 4710/6710 and Neuro 6330: Functional Neuroimaging (Fall 2011, 2013, 2014, 2015, 2016)
- Responsible conduct of research - Protection of Human Subjects (2010, 2011)

e) Service

Journal Editorial Board Member and Editor

1. Nature Scientific Reports, Biological Physics and Neuroscience (2016 – present)
2. Open Journal of Medical Imaging (2011 - present)
3. Webmed Central Plus – Lead Faculty for Neurosciences (2012 - present)
4. SM Journal of Neurology and Neuroscience (2016 – present)
5. SciTz Neurology and Neurosciences (2016 – present)

Manuscript Reviewer

on average, ~25 submissions per year reviewed since 2007

1. Brain Connectivity
2. Brain Topography
3. Behavioral and Brain Functions
4. Biological Cybernetics
5. Biomed Central: Neuroinformatics
6. Biomed Central: Systems Biology
7. Brain, Behavior and Evolution
8. Brain Research
9. Brain Structure and Function
10. Chaos: an interdisciplinary journal of nonlinear science
11. Chaos, Solitons and Fractals
12. Cognitive Neurodynamics
13. Communications in Nonlinear Science and Numerical Simulations
14. Computational and Mathematical Methods in Medicine
15. Computational Neuroscience Conference Proceedings
16. Computational Neuroscience Society
17. eLife
18. European Journal of Neuroscience
19. Europhysics Letters
20. Frontiers in Computational Neuroscience
21. Frontiers in Human Neuroscience
22. Frontiers in Systems Neuroscience
23. Human Brain Mapping Conference Abstracts
24. IEEE Journal of Selected Topics in Signal Processing
25. IEEE Transactions on Biomedical Engineering
26. IEEE Transactions on Medical Imaging
27. Integrated Computer-Aided Engineering
28. International Journal of Neural Systems
29. International Review of Financial Analysis
30. Journal of Biological Physics
31. Journal of Clinical Neurophysiology
32. Journal of Neurophysiology
33. Journal of Neuroscience
34. Journal of Neuroscience Methods
35. Journal of Physics A
36. Human Brain Mapping
37. Math Problems in Engineering
38. Neural Networks
39. Neurocomputing
40. NeuroImage

41. Neuroscience
42. Neuropsychologia
43. Nonlinear Dynamics
44. Open Journal of Medical Imaging
45. Philosophical Transactions of the royal society A
46. Physica A
47. Physica D
48. Physics Letters A
49. Physics of Life Reviews
50. Physical Review Applied
51. Physical Review E
52. Physical Review Letters
53. PLOS one
54. Review of Scientific Instruments
55. Webmed Central Plus

Grant Proposal Reviewer/Panelist for

1. National Science Foundation (Panelist-April and May, 2015's panels)
2. Austrian Science Fund
3. Fonds Wetenschappelijk Onderzoek (FWO)
4. GSU/GaTech Advanced Brain Imaging Center
5. GSU Brains and Behavior Program

Departmental Committee

1. Physics and astronomy website update committee chair (2011, 2012 - 2014)
2. Physics and astronomy faculty search committee member, 2012
3. Publicity committee chair, 2013 – present
4. Curriculum committee member, 2013 – present
5. Graduate committee member, 2013 – present
6. By-laws committee member, 2013 – 2014
7. Colloquium committee member, 2013 – present
8. Computing committee member, 2013 – present

College Committee

1. Curriculum committee member (2013 - 2015)

University and Inter-University Committees

1. Brains and Behavior Interdisciplinary Committee Member (Elected), 2011 – 2014
2. Brains and Behavior Interdisciplinary Committee Chair, 2014 - 2015
3. Institutional Review Board Member for GSU/GaTech Center for Advanced Brain Imaging, 2009 – 2012, 2014 - present
4. Neuroscience Institute Website Update Committee Member, 2011 - present
5. 2CI Functional NeuroImaging Faculty Search Committee Member, 2012 - 2014

Conferences organized, chaired

1. Co-organizer: International conference on Applications of Mathematics to Nonlinear Sciences, Kathmandu, Nepal, May 26 – 29, 2016.
2. International conference organizer and chair: BrainModes 2015: Course and workshop, December 8 – 12, 2015
3. Workshop organizer and chair: Atlanta Functional Neuroimaging, GSU, Atlanta, April 25, 2014

4. Chaired a session in an international workshop: Chaos, Complexity and Dynamics in Biological Networks, Corsica, France, May 28 - June 2, 2012
5. Workshop: Dynamics of bursting activity of neurons, GSU, Atlanta, co-organized and chaired a session with S. Bahar, I. Belykh, G. Cymbalyuk, V. Bondrenko, R. Calabrese, R. Clewely, A. Shilnikov, April 16 - 17, 2010
6. Chaired: Computational Biophysics, SESAPS meeting, Atlanta, 2009

Public outreach service

- The Annual Georgia Science Olympiad Regional Tournament, waves-optics or electricity-magnetism related event, 2008, 2010, 2011, 2012, 2013, 2014, 2015
- Physics Fun camp for high school students in Georgia, 2009 (Coordinator: Dr. Unil Perera)

Host to external guest speakers

- Prof. X. Hu, Biomedical Engineering, GaTech/Emory University, Atlanta, 2008
- Prof. Y.-C. Lai, Electrical Engineering, Arizona State University, Tempe, 2009
- Prof. C. M. Epstein, Department of Neurology, Emory University, Atlanta, 2010
- Prof. G. Buzsáki, Center for Molecular and Behavioral Neuroscience, Rutgers, The State University of New Jersey, NJ, 2011
- Dr. P. Chapagain, Department of Physics, Florida International University, Miami, 2011
- Dr. Dean Sabatenelli, Department of Psychology, University of Georgia, Athens, 2012
- Prof. Kurt Wiesenfeld, School of Physics, Georgia Institute of Technology, Atlanta, 2013
- Dr. Tim Fox, Emory University School of Medicine, Atlanta, 2013
- Dr. Hualou Liang, Drexel University School of Biomedical Engineering, Philadelphia, 2014
- Dr. David van Essen, Washington University, St. Louis, Missouri, 2015
- Dr. Kimford Meador, Stanford University, 2015

Nikolaus Dietz: Publications and Presentations History

(last update: Jan. 20, 2017)

For preprints & print of selected publications see: http://www.physics.gsu.edu/dietz/publications.html

PATENTS

6 "Incoherent Type-III materials for charge carriers control devices," Raphael Tsu, Nikolaus Dietz and Ian T. Ferguson, Priority date Feb. 27, 2013, Application# 61/770,037; WIPO Publication No. WO/2014/134310 published Apr. 9, 2014; International Appl. No. PCT/US2014/019032.

5 "High Pressure Chemical Vapor Deposition Apparatuses, Methods, and Compositions Produced Therewith," Nikolaus Dietz; US Patent No. 9,243,329, issued Jan. 26, 2016, priority date Aug. 12, 2009. http://pdfpiw.uspto.gov/.piw?Docid=09243329

4 "Optical confined birefringent Chalcopyrite heterostructure devices and operating methods," N. Dietz, F. L. Madarasz, and D. P. Krivoshik; filed Dec. 10, 2001, issued Dec. 21, 2004, US Patent Number 6,834,149.

3 "Chalcopyrite based nonlinear waveguided heterostructure devices and fabrication and operating methods," N. Dietz and K. J. Bachmann, filed February 9, 1999, issued Aug. 27, 2002, US Patent Number 6,442,319.

2 "Methods for Monitoring and Controlling Deposition and Etching using P-Polarized Reflectance Spectroscopy," K. J. Bachmann, N. Dietz and A.E. Miller, filed Aug. 1994, issued Sep. 3, 1996, US Patent Number 5,552,327.

1 "Spektroskopische Untersuchungsmethode für einen Stoff im Energiebereich geringer Absorption," H. J. Lewerenz and N. Dietz; disclosure published Aug. 8 1992, patent issued Sept. 21 2006, FRG Patent Number DE 4211741.

IN POPULAR PRESS

"The Future is Bright and Electric," Fall 2007: GSU Home Page / "A Bright Future," Georgia State Magazine, Fall 2007

"Solid state molecular sensor for detection of chemical and biological agents," N. Dietz, F. Madarasz and R. Inguva, SPIE Newsroom, DOI: 10.1117/2.1200601.0003 (2006).

BOOKS/ PROCEEDINGS

2. Proceedings of SPIE Volume 9954: "Fifteenth International Conference on Solid State Lighting and LED-based Illumination Systems, 995401;" ed. M. H. Kane; N. Dietz; I. T. Ferguson (Nov. 30, 2016) doi:10.1117/12.2256093

1. Proceedings of SPIE Volume 9571: "Fourteenth International Conference on Solid State Lighting and LED-based Illumination Systems, 957101;" ed. M. H. Kane; L. Jiao, N. Dietz; J.-J. Huang (Oct. 1 2015) doi:10.1117/12.2208514

REVIEWS

8. "Toward Understanding and Control of Nanoscale Phase Segregation InGaN Alloys," Y. Abate, V. E. Babicheva, V. S. Yakovlev, and N. Dietz, book chapter 6 in "III-Nitride Materials, Devices and Nano-Structures," ed. Zhe Chuan Feng; World Scientific Europe Ltd, ISBN: 978-1-78634-318-5 (2017); http://www.worldscientific.com/worldscibooks/10.1142/q0092
7. "The Group III-Nitride Material Class: from Preparation to Perspectives in Photoelectrocatalysis," R. Collazo and N. Dietz, book chapter 8 in 'Photoelectrochemical Water Splitting: Issues and Perspectives,' ed. H-J. Lewerenz and L.M. Peter, RSC Publishing, pp. 193-222, (2013). http://dx.doi.org/10.1039/9781849737739-00193
6. "Confined nonlinear II-IV-V_2 waveguide structures for compact chemical and biological sensors," N. Dietz and Madarasz, book chapter 8 in 'Nonlinear Optics and Recent Advances in Optics,' ed. H. A. Abdeldayem and D. O. Frazier, Research Signpost, pp. 207-232, ISBN: 978-81-7736-073-8 (2007).
5. "Indium-nitride growth by HPCVD: Real-time and ex-situ characterization," N. Dietz, book chapter 6 in "III-Nitrides Semiconductor Materials", ed. Z.C. Feng, Imperial College Press, ISBN 1-86094-636-4, pp. 203-235 (2006).
4. "Chemical and Biological Sensors based on optically confined birefringent chalcopyrite heterostructures," N. Dietz and F. L. Madarasz, Mater. Sci. & Eng. B, Vol. **97**(2) pp. 182-195 (2003).
3. "Real-Time Process monitoring by P-Polarized Reflectance Spectroscopy and Closed-Loop Control of Vapor Phase Epitaxy," T.H. Banks, N. Dietz and K. Ito, in "Encyclopedia of Materials: Science and Technology"; ISBN: 0-08-043152-6; (Elsevier Science Ltd), pp. 9488-9497 (2001).
2. "Real-Time Optical Characterization of Thin Film Growth," N. Dietz, Mater. Sci. & Eng. B**87**(1), pp. 1-22 (2001).
1. "Real-time Monitoring of Epitaxial Processes by p-Polarized Reflectance Spectroscopy," N. Dietz and K.J. Bachmann, MRS Bulletin Vol.**XX**(5), pp. 49-55 (1995).

PUBLICATIONS

149 "Nanoscopy of Phase Separation in $In_xGa_{1-x}N$ Alloys," Y. Abate, D. Seidlitz, A. Fali, S. Gamage, V. E. Babicheva, V. S. Yakovlev, M. I. Stockman, R. Collazo, D. E. Alden, and N. Dietz, ACS Applied Materials & Interfaces, Vol.8 (35), pp 23160–23166 (2016); http://dx.doi.org/10.1021/acsami.6b06766

148 "Effect of AlN buffer layers on the structural and optoelectronic properties of InN/AlN/Sapphire heterostructures grown by MEPAMOCVD," M. K. Indika Senevirathna, D. Seidlitz, Al. Fali, B. Cross, Y. Abate and N. Dietz, 15th Int. Conf. on SSL and LED-based Illumination Systems, Proc. of SPIE Vol. 9954, http://dx.doi.org/10.1117/12.2237957

147 "Enhancement in c-Si solar cells using 16nm InN nanoparticles," F. I. Chowdhury, A. Alnuaimi, S. Alkis, B. Ortaç, S. Aktürk, M. Alevli, N. Dietz, A. K. Okyay and A. Nayfeh, Mater. Res. Express 3(5) p. 056202 (2016); http://dx.doi.org/10.1088/2053-1591/3/5/056202

146 "Optoelectronic and structural properties of InGaN nanostructures grown by plasma-assisted MOCVD," D. Seidlitz, M. K. I. Senevirathna, Y. Abate, A. Hoffmann and N. Dietz, Proc. SPIE Vol. 9571 (OP220), 14th Int. Conf. SSL & LED-based Illum. Systems, Aug 12-13, 2015 p.95710P (Sept. 8, 2015); http://dx.doi.org/10.1117/12.2188612

145 "Enhancement of polycrystalline silicon solar cells efficiency using indium nitride particles," S. Alkis, F. I. Chowdhury, M. Alevli, N. Dietz, B. Yalızay, S. Aktürk, A. Nayfeh and A. K. Okyay, Journal of Optics **17**(10), p.105903 (2015); http://dx.doi.org/10.1088/2040-8978/17/10/105903

144 "Effect of reactor pressure on optical and electrical properties of InN films grown by high-pressure chemical vapor deposition," M. Alevli, N. Gungor, S. Alkis, C. Ozgit-Akgun, I. Donmez A.K. Okyay, S. Gamage, I. Senawirathne, N. Dietz and N. Biyikli, Dietz, Phys. Stat. Sol. C **12**(4-5) pp. 423–429 (2015); doi: 10.1002/pssc.201400171

143 "A Near-Infrared Range Photodetector Based on Indium Nitride Nanocrystals Obtained Through Laser Ablation," B. Tekcan, S. Alkis, M. Alevli, N. Dietz, B. Ortaç, N. Biyikli, and A.K. Okyay, IEEE Electron Device Lett. **35** (9) pp.936-9, Sept. 2014; doi: 10.1109/LED.2014.2336795

142 "Enhanced memory effect via quantum confinement in 16 nm InN nanoparticles embedded in ZnO charge trapping layer," N. El-Atab, F. Cimen, S. Alkis, B. Ortaç, M. Alevli, N. Dietz, A.K. Okyay, and A. Nayfeh, Appl. Phys. Lett. **104**(25), p.253106 (2014); doi.org/10.1063/1.4885397

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INVITED PRESENTATIONS

52 "Development of indium-rich group III-nitride heterostructures," Nikolaus Dietz, invited seminar lecture on "Semiconductors & Nanophotonics," Technical University Berlin, Institute of Solid State Physics; Berlin Germany, June 16th (2016).

51 "Growth and analysis of indium-rich lnGaN epilayers and heterostructures thereof," Nikolaus Dietz, 'Workshop on Compound Semiconductor Materials and Devices," WOCSEMMAD 2016,' February 1-4, 2016 • Tucson, AZ.

50 "Development and integration of indium-rich group III-nitrides for energy generation/utilization," Nikolaus Dietz, 11th IEEE International Conference HONET-PfE (Photonics for Energy and Enabling Technologies)," invited HS2-2, Monday Dec. 15, 2014 @13:50, UNC Charlotte; Charlotte, NC; http://www.honet.uncc.edu/speakers/Nikolaus_D.htm

49 "Perspectives of Group III-Nitride Material for Photoelectrocatalysis," Nikolaus Dietz, 225th ECS Meeting, session "Electronic and Photonic Devices and Systems - Q2: Wide Bandgap Semiconductor Materials and Devices 15," paper #Q2-1533, Wed. May 14, 2014; Hilton Orlando Bonnet, Orlando, FL (2014); https://ecs.confex.com/ecs/225/webprogram/programs.html

48 "Research on physical properties of semimagnetic compound semiconductors: Prof. Gumlich's contributions and vision of its relevance," Nikolaus Dietz, commemoration ceremony colloquium contribution at Technische Universität Berlin; Berlin Germany, Oct. 25th (2013).

47 "The development of indium-rich InGaN epilayers and heterostructures," Nikolaus Dietz, invited seminar lecture at SFB 787 on "Semiconductor - Nanophotonics," Technical University Berlin, Institute of Solid State Physics; Berlin Germany, July 09th (2013).

46 "Group III-Nitride Materials Research for Renewable Energy Use," Nikolaus Dietz, invited seminar lecture for "Nanoscience & Nanotechnology for Renewable Energy Applications" at the "International Workshop on Cleanroom training for critical & sustainable technologies: Renewable Energy," Bilkent University - UNAM, Ankara, Turkey, Thursday, June 27th (2013).

45 "Physical principles of group III-V thin film growth and growth monitoring," Nikolaus Dietz, invited seminar and lecture in the Department of Physics at Marmara University, Istanbul Turkey, June 24th (2013).

44 "Growth and characterization of indium-rich InGaN epilayers," Nikolaus Dietz, seminar Tuesday, Sept 04, 2012, at Helmholtz-Zentrum Berlin (HZB), Institute Solar Fuels; Berlin Germany (2012).

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21 "InN growth at elevated pressures," Department of Photovoltaic, Hahn-Meitner-Institute Berlin Dec 19, 2002.

20 "The development of II-IV-V_2 ferromagnetic nanocomposites and confined heterostructures," Department of Physics, Technical University Berlin, Dec 16, 2002.

19 "Real-time monitoring of flow kinetics and gas phase reaction under high-pressure CVD condition," Department of Photovoltaic, Hahn-Meitner-Institute Berlin, May 15, 2001.

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3 "Real-time monitoring of deposition and etching processes by P-polarized reflectance spectroscopy," Hiroshima University, Higashi-Hiroshima, Japan, June 24, 1996.

2 "Time-resolved Photoluminescence of $ZnGeP_2$," at Stutenhaus-Workshop 'The Control of Stoichiometry in Semiconductor Heterostructures: Interfacial Chemistry - Property Relations', Suhl, Germany, August 21-26, 1995.

1 "New Optical Methods for Semiconductor Characterization and Real-Time Process Monitoring," Dept. of Physics, NCSU, Raleigh, NC, April 25, 1995.

PRESENTATIONS

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111 "Near-Field Spectroscopy and Imaging of Single Nanoparticles," Yohannes Abate, D. Seidlitz, A. Fali, S. Gamage, V.E. Babicheva, V.S. Yakovlev, M.I. Stockman, R. Collazo, D. Alden, and N. Dietz, Mon. Nov. 07, 2016 @ 10:40am Session SP+AS+MI+NS+SS-MoM8; AVS 63rd International Symposium; Nashville, TN, Nov. 06-11, 2016

110 "Infrared nanoscopy of In-rich InGaN epilayers" D. Seidlitz, A. Fali, I. M. K. Senevirathna, D. Alden, R. Collazo, Y. Abate, A. Hoffmann and N. Dietz; Paper# OP16O-OP220-24, Aug. 28, 2016 at 10:25am, 15th Int. Conference on Solid State Lighting and LED-based Illumination Systems, San Diego, CA; Aug 28 - Sep. 01, 2015.

109 "Structural Qualities of GaN Grown on AlN Buffer Layer by MEPA-MOCVD," Daniel Seidlitz, I. Senevirathna, A. Fali, Y. Abate, A. Hoffmann, N. Dietz, Mon. Nov. 07, 2016 @ 9:40am Session EM+NS+PS+SS+TF-MoM; Growth and Devices Technology of Group III-Nitrides; AVS 63rd International Symposium; Nashville, TN, Nov. 06-11, 2016

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108 "In-rich InGaN with $In_{0.5}Ga_{0.5}N$ buffer layer grow on sapphire by HPCVD studied by X-ray diffraction and X-ray absorption spectrometry," Chieh Miao Chang, Chih-Han Hsueh, Ferry Wiryo Pranoto, Mu-Chi Liu, Hao-Hsiung Lin, N. Dietz, Jenn-Min Lee, Zhe Chuan Feng, OPTIC 2015 -International Conference Optics & Photonics Taiwan, National Tsing Hua University (NTHU), Hsinchu, Taiwan, Dec. 4 - 6, 2015.

107 "Infrared nanoscopy of indium-rich InGaN epilayers," Yohannes Abate, Daniel Seidlitz and Nikolaus Dietz, Thursday Oct. 22, 2015 @ 8:20am (EM+MS-ThM2) EMPD session "III-N Nitrides for Optoelectronic Applications," AVS 62nd International Symposium; San Jose, CA, Oct. 18–23, 2015.

106 **"**State-Of-The-Art High Efficiency Thermoelectric Material: III-Nitrides as a Wide Bandgap Semiconductor," B. Kucukgok, Na Lu, Nikolaus Dietz, Ian Ferguson, Thursday Oct. 22, 2015 @ 9:00am (EM+MS-ThM4) EMPD session "III-N Nitrides for Optoelectronic Applications," AVS 62nd International Symposium; San Jose, CA, Oct. 18–23, 2015.

105 "Growth Control of InGaN Alloys and Nanostructures by Migration-Enhanced, Plasma-Assisted MOCVD," Daniel Seidlitz, Indika Senevirathna, Yohannes Abate, Nikolaus Dietz, Axel Hoffmann, Thursday Oct. 22, 2015 @ 4:40pm (E EM+MS-ThA8) EMPD session "III-N Nitrides for Optoelectronic Applications," AVS 62nd International Symposium; San Jose, CA, Oct. 18–23, 2015.

104 "Optoelectronic and structural properties of InGaN grown by Migration-Enhanced, Plasma-Assisted MOCVD," Daniel Seidlitz, M.K.I. Senevirathna, Y. Abate, A. Hoffmann and Nikolaus Dietz, 14th Int. Conference on Solid State Lighting and LED-based Illumination Systems, San Diego, CA; Aug 12-13, 2015.

103 "Enhanced Light Scattering with Energy Downshifting Using 16 Nm Indium Nitride Nanoparticles for Improved Thin-Film a-Si N-I-P Solar Cells," F. I. Chowdhury, K. Islam, S. Alkis, B. Ortaç, M. Alevli, Nikolaus Dietz, A. Okyay, and A. Nayfeh, 227th ECS Meeting, May 24-28, 2015, Chicago, Illinois, USA - Hilton Chicago

102 "Advances in migration-enhanced, plasma-assisted MOVCD growth of III-N layers," Nikolaus Dietz, Daniel Seidlitz, Indika Senevirathna, 'Workshop on Compound Semiconductor Materials and Devices," WOCSEMMAD 2015,' February 16-19, 2015 • Isle of Palms, SC.

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101 Enhanced Retention Characteristic of MOS Charge Trapping Memory with InN Nanoparticles Embedded in ZnO Charge Trapping Layer," N. El-Atab,F. Cimen, S. Alkis, B. Ortac, M. Alveli, N. Dietz, A.K. Okyay, A. Nayfeh; MSR Fall Meeting 2014 presentation M1.05 @9:45am, session : AA6: Dislocation Structure and Relaxation," Dec. 1, 2014, Symposium M: Materials and Technology for Nonvolatile Memories (2014)

100 "MEPA-MOCDV Growth of GaN/GaInN Epilayers and their Structural and Optoelectronic Properties," D. Seidlitz, R. Kirste, R. Samaraweera, M. R. Bobea, Z. Sitar, N. Dietz, R. Collazo, and A. Hoffmann; presentation AA6.05 @11:45 AM , session : AA6: Dislocation Structure and Relaxation," Dec. 3, 2014, Symposium AA: Synthesis, Processing and Mechanical Properties of Functional Hexagonal Materials (2014)

99 "Growth Template Impact on the Properties of InN Epilayers Grown by High-Pressure CVD," N. Dietz, S. Gamage, M.K.I. Senevirathna, R. Kirste, R. Collazo, B. Hussain, I.T. Ferguson; Paper# EM+EN-FrM11, Fri. Nov. 14, 2014 @ 8:20am, session "Nitrides for LED and PV Device Applications," AVS 61st International Symposium; Baltimore, MD, Nov. 9-14 2014.

98 "Real-time InGaN growth monitoring during plasma-assisted MOCVD," D. Seidlitz, R.L. Samaraweera, B. Hussain, I. Ferguson, and N. Dietz, Symp. SPIE Opt. Eng. & Appl., Session 7: III-Nitride LEDs for SSL, Aug. 21, 2014 at 2 pm, SPIE Paper# 9190-29, 13th Int. Conf. on SSL and LED-based Illumin. Systems; San Diego, CA (2014).

97 "Property analysis of InGaN layers grown by remote-plasma assisted MOCVD," R.L. Samaraweera, D. Seidlitz, I. M. Senevirathna, B. Kucukgok, B. Hussain, I. Ferguson, and N. Dietz, Symp. SPIE Opt. Eng. & Appl., Session 7: III-Nitride LEDs for SSL, Aug. 21, 2014 at 2:40 pm, SPIE Paper# 9190-31, 13th Int. Conf. on SSL and LED-based Illumin. Systems; San Diego, CA (2014).

96 "InGaN growth studies using migration-enhanced, remote-plasma MOCVD," R. L. Samaraweera, D. Seidlitz, M.K.I. Senevirathna, B. Kucukgok, B. Hussain, I. Ferguson, and N. Dietz, 5th Int. Conf. White LEDs and Solid State Lighting (WLED-5), Presentation, Paper# A1028, June 1- 5, Samdo2-dong, Jeju City, Jeju-do, Korea (2014); http://www.wled5.org/

95 "Effect of Reactor Pressure on The Optical And Electrical Properties of HPCVD Grown InN Films," M. Alevli, C. Ozgit-Akgun, I. Donmez, A. K. Okyay, N. Biyikli, S. Gamage, I. Senevirathna and N. Dietz, 5th Int. Symp. Growth of III-Nitrides (ISGN-5), presentation#G1, contr#1966892, May 20, 12:15-11:45am, Atlanta, GA (2014).

94 "Advances in migration-enhanced, plasma-assisted MOVCD growth of InGaN epilayers," Nikolaus Dietz, 'Workshop on Compound Semiconductor Materials and Devices," WOCSEMMAD 2014,' February 16-19, 2014, San Antonio, Texas.

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93 "The growth and structural properties analysis of indium-rich InGaN epilayers," S. Gamage, K. Nanayakkara, M.K.I. Senevirathna, A. Melton, I. Ferguson, and N. Dietz, session EM+NS+SS+TF-FrM9 at 11:20am, Nov. 01, 2013; 60th AVS Int. Symposium. Long Beach CA (2013).

92 "InGaN epilayer growth using migration-enhanced, remote-plasma MOCVD," R. L. Samaraweera, F. Güth, K. Nanayakkara, M.K.I. Senevirathna and N. Dietz, session EM+NS+SS+TF-FrM9 at 11:00am, Nov. 01, 2013; 60th AVS Int. Symposium. Long Beach CA (2013).

91 "Is GaN:Gd a Viable Route for Spin Polarized Emitters?" A. G. Melton, B. Kucukgok, Z. Liu, N. Dietz, N. Lu and I. T. Ferguson, NSF-Workshop: US-Japan Frontiers in Novel Photonic-Magnetic Devices, Kasugano-so, Nara, Japan, September 20-23, (2013).

90 "The exploration of InGaN based incoherent type-III heterostructures," Nikolaus Dietz, I. Ferguson, and R. Tsu, 'Workshop on Development of Man Made Electronic Materials and Devices: Past and Future,' May 5-7, 2013; UNC Charlotte, NC

89 "HPCVD and Migration-enhanced, remote-plasma MOVCD growth of group III-Nitride epilayers," Nikolaus Dietz, 'Workshop on Compound Semiconductor Materials and Devices 2013,' February 17-20, 2013, New Orleans, LA

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88 "Development of High Indium InGaN Films for Use In Tandem Solar Cells," Andrew G. Melton, Bahadir Kucukgok, Na Lu, Nikolaus Dietz and Ian T. Ferguson MRS Fall Meeting 2012, Boston MA, USA; Symposium E: Photovoltaic Technologies–Materials, Devices, and Systems Symposium Tues. 8:45 pm, November 29, 2012.

87 "Dependence of Gallium Incorporation and Structural Properties of indium-rich $In_xGa_{1-x}N$ Epilayers on Ammonia - MO Precursor Pulse Separation," S. Gamage, R. Atalay, M.K.I. Senevirathna, R.L. Samaraweera, A. Melton. I. Ferguson, and N. Dietz, Thur. Nov. 01, 2012 - Paper ThA-11 (Electronic Materials and Processing) at AVS 59th International Symposium, Tampa, FL, 2012.

86 "Effect of V/III molar ratio and reactor pressure on the optical properties InN," M. K. I. Senevirathna, S. Gamage, R. L. Samaraweera, R. Atalay, A. G. U. Perera, A. Melton, I. Ferguson, and N. Dietz, Thur. Nov. 01, 2012 - Paper ThA-09 (Electronic Materials and Processing) at AVS 59th International Symposium, Tampa, FL, 2012.

85 "Effect of V/III molar ratio and reactor pressure on the optical properties InN" R. Atalay, M. Buegler, S. Gamage, M. K. I. Senevirathna, B. Kucukgok, A. G. Melton, I. T. Ferguson, and N. Dietz; Twelfth International Conference on Solid State Lighting; Conference OP220; August 2012, San Diego, CA, paper# Paper: 8484-30, Aug. 16 (2012).

84 "Growth and characterization of indium-rich InGaN epilayers" Nikolaus Dietz, 'The Workshop on Compound Semiconductor Materials and Devices - WOCSEMMAD 2012,' February 19-22, 2012, Napa Valley, CA

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84 "The Effect of Ammonia - TMI Pulse Separation on the Structural Properties of InN Epilayers" Ramazan Atalay, M. Buegler, S. Gamage, I. Senevirathna, U. Perera, J. Tweedie, R. Collazo, and N. Dietz, Mon. Oct. 31, 2011 - Paper EM1-MoA-4 (Electronic Materials and Processing) at AVS 58th International Symposium, Nashville TN, Oct. 31 - Nov. 04, 2011.

83 "Digital precursor injection approach for improved indium-rich InGaN epilayers grown by HPCVD," Nikolaus Dietz, Paper# 8123-10, Monday Aug. 22 at 5:15pm; Conference 8123, Eleventh International Conference on Solid State Lighting, SPIE 2011, 21 - 25 August 2011, San Diego, CA.

82 "Nanoplasmonics in direct band-gap semiconductors" Nikolaus Dietz and Mark Stockman, Paper# 8096-38, Tuesday Aug. 23 at 4:20pm; Conference 8096 – "Plasmonics: Metallic Nanostructures and Their Optical Properties IX," SPIE 2011, 21 - 25 August 2011, San Diego, CA.

81 "The influence of ammonia precursor exposure and separation times on the structural properties of InN grown by pulsed," Max Buegler, S. Gamage, R. Atalay, I. Senevirathna, R. Kirste, M. Hoffmann, J. Tweedie, R. Colazzo, A. Hoffmann, Z. Sitar, I. Ferguson, N. Dietz, Wednesday May 25, 11:15am; 38th International Symposium on Compound Semiconductors - ISCS 2011; Berlin GER

80 "Indium-rich InGaN epilayers and heterostructures growth and characterization: the influence of the reactor pressure, growth temperature and surface chemistry on the phase stability," Nikolaus Dietz, Sampath Gamage, Indika Senevirathna, Ramazan Atalay and Max Buegler, 'The Workshop on Compound Semiconductor Materials and Devices - WOCSEMMAD 2011,' February 20-23, 2011, Savannah, Georgia

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79 "Optical and structural properties of $In_{1-x}Ga_xN$ epilayers," R. Atalay, M. Buegler, S. Gamage, I. Senevirathna, J. Wang, R. Kirste, A. Hoffmann, Tim Xu, M. Jamil, I. Ferguson, A.G.U. Perera and N. Dietz, Contrib. 7784-32, Wednesday - Aug. 4, 2010 - 2:30 pm, at 10th Intern. Conf. on SSL, SPIE San Diego, Aug. 1-5, 2010.

78 "Reactor pressure - growth temperature relation for InN epilayer grown by high-pressure CVD," M. Buegler, S. Gamage, R. Atalay, J. Wang, I. Senevirathna, R. Kirste, T. Xu, M. Jamil, I. Ferguson, J. Tweedie, R. Collazo, A. Hoffmann, Z. Sitar, and N. Dietz, Contrib. 7784-13 Tuesday Aug. 3, 2010 - 2:20 pm, at 10th Intern. Conf. on SSL, SPIE San Diego, Aug. 1-5, 2010.

77 "On the pursuit of a common growth window for embedded indium-rich group III-nitride heterostructures," Nikolaus Dietz, R. Atalay, M. Buegler, S. Gamage, I. Senevirathna, and J. Wang, Contrib. 7784-02 - Monday Aug. 2, 2010 - 2:30 pm, at 10th Intern. Conf. on SSL, SPIE San Diego, Aug. 2-5, 2010.

76 "Studies on single-phase, indium-rich In1-xGaxN epilayers grown by high-pressure CVD," M. Buegler, M. Alevli, R. Atalay, G. Durkaya, J. Wang, I. Senevirathne, S. Gamage, R. Kirste, J.-H. Schulze, A. Hoffmann, R. Collazo, Z. Sitar, M. Jamil, I. Ferguson, N. Dietz, APS March Meeting Vol. 55(2), Session "W25: Semiconductor Growths and Wide Bandgap Semiconductors," Portland, OR, 11:15–11:27 am, March 18 (2010).

75 "Studies on the crystal distortion – birefringence relationship in chalcopyrite $ZnGeP_2$," R. Atalay, M. Alevli, M. Buegler, G. Durkaya, and N. Dietz, APS March Meeting Vol. 55(2), Session "L25: Optical and Electronic Properties of Semiconductors," Portland, OR, 4:54 - 5:06 pm, March 16 (2010).

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74 "GaN-Based Heterojunction Structures for Simultaneous Detection of Ultraviolet/Infrared Radiation," R. Jayasinghe, G. Ariyawansa, N. Dietz, A.G.U. Perera, S. Matsik, I. Ferguson, S. Laframboise, A. Bezinger, M. Buchanan, and H.C. Liu, 76th Annual Meeting SESAPS, Nov. 12, 2009; 5:10pm, EC.00008, Atlanta, Georgia (2009).

73 "Capacitance hysteresis due to interface defect states in n^+-GaN/$Al_{0.1}Ga_{0.9}N$ heterostructures," L. Byrum, G. Ariyawansa, R. Jayasinghe, N. Dietz, A.G.U. Perera, S. Matsik, I. Ferguson, A. Bezinger, and H.C. Liu, 76th Annual Meeting SESAPS, Nov. 12, 2009; 5:00pm, EC.00007, Atlanta, Georgia (2009).

72 "Anomalous capacitance effects in GaN/$Al_{0.026}Ga_{0.974}N$ structures," G. Rothmeier, L. Byrum, N. Dietz, A.G.U. Perera, S. Matsik, I. Ferguson, A. Bezinger, and H.C. Liu, 76th Annual Meeting SESAPS, Nov. 12, 2009; 4:45pm, EC.00006, Atlanta, Georgia (2009).

71 "Characterization of high-pressure Chemical Vapor Deposition grown InGaN layers by IR reflectance spectroscopy," I. Senevirathna, M. Buegler, R. Atalay, G. Durkaya, J. Wang, and N. Dietz, 76th Annual Meeting SESAPS, Nov. 12, 2009; 4:15pm, EC.00003, Atlanta, Georgia (2009).

70 "Optical properties of InGaN layers," J. Wang, M. Alevli, R. Atalay, G. Durkaya, M. Buegler, I. Senevirathna, and N. Dietz, 76th Annual Meeting SESAPS, Nov. 12, 2009; 4:00pm, EC.00002, Atlanta, Georgia (2009).

69 "Growth of InN and In rich InGaN by High-Pressure Chemical Vapor Deposition (HPCVD)," M. Buegler, M. Alevli, R. Atalay, G. Durkaya, J. Wang, I. Senevirathna, M. Jamil, I. Ferguson, and N. Dietz, 76th Annual Meeting SESAPS, Nov. 12, 2009; 3:45pm, EC.00001, Atlanta, Georgia (2009).

68 "Nano-scale Topographical Studies on the Growth Cones of Nerve Cells using AFM," G. Durkaya, L. Zhong, V. Rehder, and N. Dietz, 76th Annual Meeting SESAPS, Nov. 12, 2009; 11:45am, CC.00006, Atlanta, Georgia (2009).

67 "High-pressure CVD: A novel growths technique for embedded InN alloys and nanostructures," M. Alevli, G. Durkaya, R. Atalay, M. Buegler and Nikolaus Dietz, International Conference on Nanomaterials and Nanosystems" (NanoMats2009) ITU Istanbul, Turkey, 3:00pm, August 10 (2009).

66 "Effects of Al fraction on the capacitance characteristics of n+-GaN/$Al_xGa_{1-x}N$ IR detectors," L. E. Byrum, G. Ariyawansa, R. Jayasinghe, N. Dietz, U. A. Perera, S. Matsik, I.T. Ferguson, A. Bezinger, and H.C. Liu, SPIE - Optics & Photonics, San Diego CA, 2-6 Aug. 2009, Infrared Detectors and Focal Plane Arrays X - Session 10: Detectors for Space Situational Awareness, Paper 7467-31, 2:00-4:50pm, 4th August (2009).

65 "Optical and structural properties of $In_{1-x}Ga_xN$ layers grown by HPCVD," M. Buegler, G. Durkaya, E. Malguth, W.E. Fenwick, I.T. Ferguson, and N. Dietz, SPIE - Optics & Photonics, San Diego CA, 2-6 Aug. 2009, Ninth International Conference on Solid State Lighting, Session 7: Growth III, Paper 7422-23, 8:15-10:05am, 5th August (2009).

64 "The growth and characterization of indium-rich InGaN alloys and heterostructures by high-pressure CVD," N. Dietz, M. Alevli, R. Atalay, M. Buegler, G. Durkaya, E. Malguth, and I.T. Ferguson, E-MRS June 8-12, 2009, Strasbourg, France, Symposium J - Group III nitride semiconductors, 11:15am, June 09 (2009).

63 "Optical properties of ferromagnetic (Ga,Gd)N," E. Malguth, S. Gupta, O. Hitzemann, M. Kaiser, W, Gehlhoff, A. Melton, M. Wagner, J. H. Schulze, N. Dietz, A. Hoffmann, and I.T. Ferguson, E-MRS June 8-12, 2009, Strasbourg, France, Symposium J - Group III nitride semiconductors, 9:00am, June 12 (2009).

62 *"GaN-Based Heterojunction Structures for Ultraviolet/Infrared Dual-Band Detection,"* A. G. U. Perera, R. C. Jayasinghe, G. Ariyawansa, N. Dietz, S. G. Matsik, I. T. Ferguson and H. C. Liu, 2009 IEEE Nanotechnology Materials and Devices Conference," June 2-5, 2009, Traverse City, Michigan, USA (2009).

61 "Electron accumulation on bare and hydrogenated indium nitride surfaces," B. Thoms, R. Bhatta, A. Acharya, M. Alevli, and N. Dietz, 2009 APS March Meeting, Session Y12: Electronic and Lattice Properties, Including Quantum Size Effects, Abstract Y12.00015, Pittsburgh, Pennsylvania, March 20 (2009).

60 "Surface Morphological Studies on Nerve Cells by AFM," G. Durkaya, L. Zhong, V. Rehder, N. Dietz, 2009 APS March Meeting, Session J40: Biological Physics II, Abstract J40.00008, Pittsburgh, Pennsylvania, March 20 (2009).

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59 "The characterization of InN properties grown by high-pressure CVD," N. Dietz, M. Alevli, R. Atalay, M. Buegler, G. Durkaya, R. Collazo, J. Tweedie, S. Mita and Z. Sitar, 14th International Conference of Metalorganic Vapor Phase Epitaxy: IC-ICMOVPE-XIV, METZ, France; We-A1.1, 10am, June 04 (2008).

58 "Raman analysis and luminescence properties of InN layers grown by high pressure CVD," R. Kirste, J.-H. Schulze, M.R. Wagner, M. Alevli, A. Hoffmann, and N. Dietz, 7th International Symposium on Semiconductor Light Emitting Devices, April 27 - May 2, Phoenix, Arizona (2008).

57 "Effect of hydrogen on surface electron accumulation in InN films," R. Bhatta, B. Thoms, M. Alevli, and N. Dietz, 2008 APS March Meeting Session D37: Optical Properties of Semiconductors, March 10, 2008, New Orleans, Louisiana (2008).

56 "Optical properties of InN layers grown by high pressure CVD," R. Kirste, M. Alevli, M. R. Wagner, N. Dietz, and A. Hoffmann; 72. Annual Meeting of the DPG and DPG Spring Meeting of the Condensed Matter Division, Berlin, February 25-29, 2008.

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55 "Electron Band Structure of MnGaN," D. Alexandrov; N. Dietz; I. Ferguson; H. Yu; MRS Symp. Q: Nitrides and Related Bulk Materials; Nov. 25-30, 2007; Boston, MA (Session Q5.2, Wed, Nov 28 - 8:30 am).

54 "Optical Characterezation of InN layers grown by High-Pressure CVD," M. Alevli, G. Durkaya, R. Kirste, A. Weesekara, A.G.U. Perera, A. Hoffmann, and N. Dietz; AVS 54th Intern. Symp.; Oct. 14-19, 2007; Seattle, WA (Session TF1-ThA10, Thursday Oct. 18, 5 pm).

53 "Desorption of Hydrogen from the Indium Nitride Surface Studied by HREELS," R.P. Bhatta, B.D. Thoms, M. Alevli, and N. Dietz; AVS 54th Intern. Symp.; Oct. 14-19, 2007; Seattle, WA (Session SS2-ThM2, Thursday Oct. 18, 8:20 am).

52 "Structural and Surface-Morphological Analysis of InN Layers Grown by HPCVD," G. Durkaya, M. Alevli, R. Atalay, W. Fenwick, I. Ferguson, and N. Dietz; AVS 54th Intern. Symp.; Oct. 14-19, 2007; Seattle, WA (Session SS2-ThM1, Thursday Oct. 18, 8 am).

51 "The Growth and Characterization of InN Layers Grown by High pressure CVD," Nikolaus Dietz; Mustafa Alevli; Ramazan Atalay; Goksel Durkaya; William Fenwick; Hun Kang; and Ian Ferguson; at 7th Int'l Conference on Nitride Semiconductors (ICNS-7) Sept 16-21, 2007, LasVegas, Nevada (Thursday, September 20, 2007 10:15 am)

50 "Dual band HEIWIP detectors with nitride materials," A. G. Unil-Perera, G. Ariyawansa, M. Alevli, N. Dietz, S. G. Matsik, I. T. Ferguson, H. Luo, A. Bezinger, H. C. Liu, in "Infrared Spaceborne Remote Sensing and Instrumentation XV" at the SPIE meeting in San Diego, California, Wednesday 29 August 2007, 9:00 am, Paper 6678-25.

49 "The Characterization of InN layers grown by High Pressure CVD," M. Alevli, G. Durkaya, R. Kriste, W.E. Fenwick, A.Weerasekara, V.T. Woods, U.A.G. Perera, I.T. Ferguson and N. Dietz, 2006 MRS Fall Meeting, Symp. I: Advances in III-V Nitride Semiconductor Materials and Devices, Session I8.4, Wed. 9:15am, Nov. 27 - Dec. 1, 2006, Boston, MA (2006).

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48 "Surface electron accumulation in indium nitride layers grown by high pressure chemical vapor deposition," R. P. Bhatta, B. D. Thoms, A. Weerasekera, A. G. U. Perera, M. Alevli, and N. Dietz, 53rd AVS 2006, Nov. 12-17, 2006, Moscone West Convention Center, San Francisco, CA, paper EM-WeM13 (2006).

47 "Structural and Optical Properties of InN layers grown by HPCVD," M. Alevli, G. Durkaya, A. Weerasekara, W. Fenwick, V. Woods., I.T. Ferguson, U. Perera[1] and N. Dietz, TMS 2006 Electronic Materials Conference, Pennsylvania State University, University Park, PA, June 30, 9:40am, FF5, (2006).

46 "MOCVD Growth of GaN and GaMnN Multifunctional Nanostructures," Shalini Gupta, Hun Kang, Martin Strassburg, Ali Asghar, Matthew Kane, William Fenwick, Nikolaus Dietz, and Ian T. Ferguson, (Symp. Semiconductor Nanostructures II, Wedn., Nov. 30, 2005, 11:30 AM Ra13.4.

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45 "Metal Organic Chemical Vapor Deposition of Zinc Oxide," W. E. Fenwick, M. Pan, J.-O Song, N. Li, S. Gupta, H. Kang, A. Asghar, M. Strasburg, N. Dietz, and I. Ferguson, MRS Fall Meeting 2005, Boston MA, USA; Symposium FF18.7 / EE9.7; Wedn. 4:15 pm, November 30, 2005.

44 "Structural, Optical, and Magnetic Behavior of in-situ Doped MOCVD Grown $Ga_{1-x}Mn_xN$ Epilayers and Heterostructures," M. Strassburg, W. E. Fenwick, M. H. Kane, A. Asghar, S. Gupta, H. Kang, C. J. Summers, N. Dietz, W. Gehlhoff, A. Hoffmann, and I. T. Ferguson, MRS Fall Meeting 2005, Boston MA, USA; Symposium FF7.4 / EE 5.5; Tues. 3:30 pm, November 29, 2005.

43 "Magneto-Optical and Structural Studies on Mn Ion States in MOCVD-grown $Ga_{1-x}Mn_xN$," N. Li, M. Strassburg, M. Kane, A. Asghar, W. Fenwick, J. Senaviratne, N. Dietz, and I. T. Ferguson, MRS Fall Meeting 2005, Boston MA, USA; Symposium II-4.7, Tues. 11:00 am, November 29, 2005.

42 "Properties of InN grown by High-Pressure CVD," V. Woods, M. Alevli, U. Habeck, H. Kang, J. Senawiratne, M. Strassburg, I. T. Ferguson, A. Hoffmann, N. Dietz, MRS Fall Meeting 2005, Boston MA, USA; Symposium FF "GaN, AlN, InN, and Related Materials", Tues. 9:45 am, November 29, 2005.

41 "Structural Properties, Lattice Dynamics, and Optical Properties of GaMnN," W. E. Fenwick, M. H. Kane, M. Strassburg, A. Asghar, S. Gupta, H. Kang, Z. Hu, S. Graham, U. Perera, N. Dietz, I. T. Ferguson, AVS 52nd Int. Symp., Oct. 30 - Nov. 4, 2005; Hynes Convention Center; Boston, MA, Abstract# 1117 (2005).

40 "Determining Composition of HPCVD Indium Nitride with Auger Electron Spectroscopy," R. P. Bhatta, B. D. Thoms, V. Woods, M. Alevli, and N. Dietz, AVS 52nd Int. Symp., Oct. 30 - Nov. 4, 2005; Hynes Convention Center; Boston, MA, Abstract# 1432 (2005).

39 "Optical and ellipsometric studies on InN layers grown by high-pressure CVD," N. Dietz, M. Alevli, Martin Straßburg, V. Woods, and Unil Perera, N. A. Stoute and D.E. Aspnes, AVS 52nd Int. Symp., Oct. 30 - Nov. 4, 2005; Hynes Convention Center; Boston, MA, Abstract# 937 (2005).

38 "Nucleation Study of GaN Nanostructures," S. Gupta, H. Kang, M. Strassburg, A. Asghar, W. Fenwick, N. Dietz, and I T. Ferguson, OISE-2005, section SE07, presentation B3, Oct. 6, 2005, 2:15pm, Atlanta, GA, USA.

37 "Structural Properties of InN Layers Grown by High-pressure CVD," V. Woods, M. Alevli, H. Kang, N. Li, I. T. Ferguson and N. Dietz, OISE-2005, section SE0, presentation A12, Oct. 6, 2005, 11:45am, Atlanta, GA, USA.

36 "Metal Organic Chemical Vapor Deposition of Zinc Oxide," W. E. Fenwick, M. Pan, J.-O. Song, N. Li, S. Gupta, H. Kang, A. Asghar, M. Strassburg, N. Dietz, and I. T. Ferguson, OISE-2005, section SE07, presentation A2, Oct. 6, 2005, 9:15 am, Atlanta, GA, USA.

35 "MOCVD-growth of nitride-based ferromagnetic semiconductors," M. Kane, M. Strassburg, W. Fenwick, A. Asghar, J. Senawiratne, Q. Song, D. Azamat, M. Wagner, U. Haboeck, Z. Hu, J. Zhang, U. Perera, W. Gehlhoff, A. Hoffmann, N. Dietz, C. Summers, and I. Ferguson, 6th International Conference on Nitride Semiconductors, Bremen (GER), Aug. 28 - Sept. 2, 2005; We-MP-5.

34 "Advanced Computational Modeling for Growing III-V Materials in OMCVD Reactors," B.H. Cardelino, C.E. Moore, C.A. Cardelino, N. Dietz, "Operational characteristics and Crystal Growth of NLO Materials III" at the SPIE meeting in San Diego, California 31 July - 4 August 2005.

33 "MOCVD-growth of GaN-based Ferromagnetic Semiconductors," M. H. Kane, M. Strassburg, W. E. Fenwick, A. Asghar, J. Senawiratne, Q. Song, Z. J. Zhang, N. Dietz, C. J. Summers, I. T. Ferguson, 12th US Biennial Workshop on Organometallic Vapor Phase Epitaxy (OMVPE 12) July 10 - 15, 2005, session "Wide Gap III (Nitrides)", at 10:45 am, July 14, 2005.

32 "A Nucleation Study of Group III-Nitride Multifunctional Nanostructures," S. Gupta, H. Kang, W. Fenwick, A. Asghar, M. Strassburg, N. Dietz, I.T. Ferguson, 16th American Conference on Crystal Growth and Epitaxy (ACCGE 16) July 10-15, 2005, session" Bulk II", at 14:30 pm, July 13, 2005.

31 "Fermi level dependence of optical and magnetic properties in MOCVD-grown GaMnN," Christoph Hums, M. Strassburg, M.H. Kane, A. Asghar, J. Senawiratne, M. Alevli, N. Dietz, C.J. Summers, I.T. Ferguson, and A. Hoffmann, 69. Spring meeting of the German Physical Society (Physics since Einstein), Berlin, GER, HL 22.9 Sa, 12:45, March 05, 2005.

30 "Preferred sites and valence states of transition metals in spintronic $ZnGeP_2$," Wolfgang Gehlhoff, Dmitri Azamat, Axel Hoffmann, and Nikolaus Dietz, 69. Spring meeting of the German Physical Society (Physics since Einstein), Berlin, GER, HL 29.1 Sa 15:00, March 05, 2005.

29 "MOCVD-grown GaMnN epilayers and nanostructures," M. Strassburg, M.H. Kane, A. Asghar, Ch. Hums, J. Senawiratne, M. Alevli, N. Dietz, C.J. Summers, I.T. Ferguson, U. Haboeck, A. Hoffmann, D. Azamat and W. Gehlhoff, 69. Spring meeting of the German Physical Society (Physics since Einstein), Berlin, GER, HL 43.3 Mo 15:30, March 07, 2005.

28 "Nucleation and growth of InN by high-pressure chemical vapor deposition: optical monitoring," V. Woods and N. Dietz, in "The 32nd Conference on the Physics and Chemistry of Semiconductor Interfaces (PCSI-32)," January 23-27, 2005.

27 "Multifunctional III-nitride dilute magnetic nanostructures as a future platform for spintronic devices," M. H. Kane, A. Asghar, A. M. Payne, C. R. Vestal, M. Strassburg, J. Senawiratne, Z. J. Zhang, N. Dietz, C. R. Summers, I. T. Ferguson, OPTOELECTRONICS 2005, San Jose, CA, USA, Jan. 23-27, 2005.

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26 Nucleation Studies of AlN/GaN Nanostructures," S. Gupta, M. Strassburg, A. Asghar, H. Kang, A. Payne, I. Ferguson, J. Senawiratne, N. Dietz, MRS Fall Meeting in Symposium E: GaN, AlN, InN, and Their Alloys, ID# E12.7, Boston, MA, Nov. 29 - Dec. 3, 2004.

25 "Development of LED Structures for General Illumination," D.B. Nicol, A. Asghar, D. Mehta, M. Tran, H. Kang, I.T. Ferguson, M. Alevli, J. Senawiratne, C. Hums, M. Strassburg, N. Dietz, A. Hoffmann, MRS Fall Meeting in Symposium E: GaN, AlN, InN, and Their Alloys, ID# E10.3, Boston, MA, Nov. 29 - Dec. 3, 2004.

24 "Impact of Manganese incorporation on the structural and magnetic properties of MOCVD-grown $Ga_{1-x}Mn_xN$," M. H. Kane, A. Asghar, H. Kang, A. M. Payne, and I.T. Ferguson, C.R. Summers, C.R. Vestal; and Z.J. Zhang, M. Strassburg, J. Senawiratne, and N. Dietz, D. Azamat, W. Gehlhoff, U. Haboeck, and A. Hoffmann, MRS Fall Meeting in Symposium E: GaN, AlN, InN, and Their Alloys, ID# E9.4, Boston, MA, Nov. 29 - Dec. 3, 2004.

23 "Optical and Structural Investigations on Mn Ion States in MOCVD-grown $Ga_{1-x}Mn_xN$," M. Strassburg; J. Senawiratne; N. Dietz; M. Kane; A. Asghar; A. Payne; I. Ferguson; C. Summers; U. Haboeck; A. Hoffmann; D. Azamat, W. Gehlhoff, MRS Fall Meeting in Symposium E: GaN, AlN, InN, and Their Alloys, ID# E9.5, Boston, MA, Nov. 29 - Dec. 3, 2004.

22 "Real-time Optical Monitoring of Ammonia Decomposition Kinetics in InN Vapor Phase Epitaxy at Elevated Pressures," N. Dietz, M. Strassburg and V. Woods, AVS 51st International Symposium, Anaheim, CA, Nov. 14-19, 2004.

21 "Advanced Computational Modeling of Vapor Deposition in a High-Pressure Reactor"; B. H. Cardelino, C.E. Moore, S. D. McCall, C. A. Cardelino, N. Dietz, K. Bachmann; Conference on Advances in Internet Technologies and Applications (CAITA); Purdue University, June 2004, ISBN:86-7466-117-3.

20 "Growth of high quality AlN single crystals and their optical properties," M. Strassburg, J. Senawiratne, N. Dietz, U. Haboeck, A. Hoffmann, V. Noveski, R. Dalmau, R. Schlesser, and Z. Sitar, 27th International Conference on the Physics of Semiconductors, Flagstaff, Arizona, July 26-30, 2004.

19 "Comparison of $Ga_{1-x}Mn_xN$ Epilayers Prepared by Ion Implantation and MOCVD"; Matthew H Kane, Adam M Payne, Christy R Vestal, Z. John Zhang, Jayantha Senawiratne, Martin Strassburg, Nikolaus Dietz, Christopher R Summers and Ian T Ferguson; International Workshop on Nitride Semiconductors, Pittsburgh, Pennsylvania, July 19 – 23, 2004.

18 "Raman, Photoluminescence and Absorption Studies on high quality AlN single crystals," J. Senawiratne, M. Strassburg, N. Dietz, U. Haboeck, A. Hoffmann, V. Noveski, R. Dalmau, R. Schlesser, and Z. Sitar, International Workshop on Nitride Semiconductors, Pittsburgh, Pennsylvania, July 19 – 23, 2004.

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17 "Real-time optical monitoring of gas phase kinetics in InN Vapor Phase Epitaxy at elevated pressures," N. Dietz, H. Born, M. Strassburg and V. Woods, in "SC4: In-Situ Monitoring of Semiconductor Growth and Processing", AVS 50th International Symposium, Baltimore, Maryland, November 2-7, 2003.

16 "Real-time optical Characterization of surface-reaction kinetics during heteroepitaxial $Ga_XIn_{1-X}P$ Growth by P-Polarized Reflectance," N. Dietz, S. Beeler, H. Tran, and V. Woods, at the "Twelfth American Conference on Crystal Growth and Epitaxy", Vail, CO, August 13-18, 2000

15 "Real-time optical monitoring of flow kinetics and gas phase reactions under high-pressure OMCVD conditions," N. Dietz, S. McCall, K.J. Bachmann, NASA Microgravity Conference, Huntsville, AL, June 4 - 8, 2000.

14 "Native Defect Characterization in $ZnGeP_2$," N. Dietz, A. Hoffmann, H. Born, A. Näser, W. Gelhoff, J. Maffetone, D. Perlov, W. Ruderman, I. Zwieback and K.J. Bachmann, MRS Fall Meeting, Boston, Nov 29-Dec 3, 1999.

13 "Real-time Monitoring of Surface Reaction Kinetics during Heteroepitaxial $Ga_XIn_{1-X}P$ Growth by P-Polarized Reflectance," N. Dietz, W. Calvet, V. Woods, and S. Beeler, 26th Conference on the Physics and Chemistry of Semiconductor Interfaces, (PCSI-26) San Diego, California, January 17-21, 1999.

12 "Real-Time Optical Control of $Ga_{1-x}In_xP$ Film Growth by P-Polarized Reflectance," N. Dietz, K. Ito and V. Woods, AVS 45th International Symposium, Baltimore, Maryland, November 2-6, 1998

11 "Development of FEL-assisted large-area mask-less deposition processes," Workshop on Scientific Opportunities for Fourth Generation Light Sources, at the APS at Argonne National Laboratory, October 27-29, 1997

10 "Defect Characterization in $ZnGeP_2$ by Time -Resolved Photoluminescence," N. Dietz, W. Busse, H. E. Gumlich, W. Ruderman, I. Tsveybak, G. Wood and K.J. Bachmann, O7.7 in Infrared Applications of Semiconductors - Materials, Processing and Devices, MRS Fall Meeting Boston, 2-6 Dec. 1996.

9 "Real-Time Optical Monitoring of Epitaxial Growth Processes by P-Polarized Reflectance Spectroscopy," N. Dietz and K.J. Bachmann, MRS Fall Meeting in Symposium L, Diagnostic Techniques for Semiconductor Materials Processing Boston, 28. Nov. 1995.

8 "Real-Time Optical Monitoring of Heteroepitaxial Growth Processes on Si under Pulsed Chemical Beam Epitaxy Conditions," N. Dietz, U. Rossow, D. E. Aspnes and K.J. Bachmann, International Symposium on "Si Heterostructures: From Physics to Devices"; Heraklion, Crete, Greece, 11-14 Sept 1995.

7 "Real-Time Optical Monitoring of $Ga_XIn_{1-X}P$/GaP Heteroepitaxy on Si under Pulsed Chemical Beam Conditions," N. Dietz, U. Rossow, D. E. Aspnes and K.J. Bachmann, Fifth International Conference on Chemical Beam Epitaxy in La Jolla CA, August 14-16 (1995).

6 "Real-Time Monitoring of Pulsed Chemical Beam Epitaxy of GaP/$Ga_XIn_{1-X}P$ Heterostructures on Si by p-Polarized Reflectance Spectroscopy," N. Dietz, U. Rossow, D. Aspnes and K.J. Bachmann, 7th Biannual Workshop on Organometallic Vapor Phase Epitaxy, April 2-6, 1995, Fort Myers, Florida.

5 "Differential Brewster Angle Spectroscopy: A New Approach for Monitoring Multilayer Film Deposition," N. Dietz, D.J. Stephens, G. Lucovsky and K.J. Bachmann, at Mat. Res. Soc. Symposium K, Boston, Fall 1993.

4 "Growth and Characterization of Si-GaP / GaP-Si Heterostructures," N. Dietz, S. Habermehl, J.T. Kelliher, G. Lucovsky and K.J. Bachmann, at Mat. Res. Soc. Symposium W, Boston, Fall 1993.

3 "Brewster-Winkel-Spektroskopie: Ein neues Verfahren zur Identifizierung von Störstellen in Halbleitern," H. J. Lewerenz, N. Dietz, Verhandl. DPG 27, HL - 15.1, Frühjahrstagung der DPG, Arbeitskreis Festkörperphysik, Regensburg 1992.

2 "Lamellar eutektisches Wachstum bei der Züchtung von $CuInS_2$-Kristallen," N. Dietz, K. Diesner, M. Fearheiley, M. Kanis, S. Fiechter, B. Hermoneit, S. Gramlich und I. Rechenberg; V27, Deutsche Gesellschaft für Kristallwachstum und Kristallzüchtung e.V.; Jahrestagung (Dresden), 11-13 March (1992).

1 "$CuInS_2$ grown under elevated pressures; Structural and defect characterization," M.L. Fearheiley, N. Dietz, S. Schroetter and H.J. Lewerenz; International Conference on Advanced Materials and Symposium on Non-stochiometry in Semiconductors, May 27-31, 1991; Strasbourg, France.

POSTER PRESENTATIONS

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75 "Migration enhanced plasma assisted MOCVD growth of InN/GaN/InN heterostructures" D. Seidlitz, Indika M. K. Senevirathna, Alireza Fali, Yohannes Abate, Axel Hoffmann and Nikolaus Dietz; Poster OP16O-OP220-21, Aug. 31, 2016 at 5:30 – 7:30pm, 15th Int. Conference on Solid State Lighting and LED-based Illumination Systems, San Diego, CA; Aug 28 - Sep. 01, 2015.

74 "Structural and optoelectronic properties of $In_xGa1-xN$ grown by migration-enhanced, plasma-assisted MOCVD". M.K.I. Senevirathna, D. Seidlitz, M. Vernon, A. Fali, Y. Abate, A. Sharma, M. D. Williams, and N. Dietz; Poster OP16O-OP220-23, Aug. 31, 2016 at 5:30 – 7:30pm; 15th Int. Conference on Solid State Lighting and LED-based Illumination Systems, San Diego, CA; Aug 28 - Sep. 01, 2015.

73 "Spectroscopic Nano-Imaging Patterned InGaN Nanolayers," Alireza Fali, S. Gamage, D. Seidlitz, I. Kankanamge, N. Dietz, Y. Abate; Poster Session SP-TuP6, Nov. 08, 2016, 6-8pm; AVS 63rd International Symposium; Nashville, TN, Nov. 06-11, 2016

72 "Effect of Initial Substrate Conditioning on Structural and Optoelectronic Properties of InxGa1-xN Grown by MEPA-MOCVD," Indika Senevirathna, D. Seidlitz, A. Fali, Y. Abate, N. Dietz, Poster Session EM-ThP2, Thu. Nov. 10, 2016, 6-8pm; AVS 63rd International Symposium; Nashville, TN, Nov. 06-11, 2016

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71 "Effect of Photoluminescent Indium Nitride Nanocrystals on the Performance of a-Si:H Solar Cell," F. I. Chowdhury, K. Islam, S. Alkis,V. Kumar, B. Ortac, M. Alevli, N. Dietz, A. K. Okyay, A. Nayfeh; MSR Fall Meeting 2014 Symposium II: Semiconductor Nanocrystals, Plasmonic Metal Nanoparticles, and Metal-Hybrid Structures, poster II5.32, Dec 2, 2014 (2014)

70 "Indium Nitride Nanocrystals Obtained through Laser Ablation for Large Area Optoelectronics," B. Tekcan, S. Alkis, M. Alevli, N. Dietz, B. Ortac, N. Biyikli, A. K. Okyay; MSR Fall 2014 Symposium AA9: Poster Session: Synthesis, Plasticity, and Theory, poster AA9.02, Dec. 3, 2014, Symposium AA: Synthesis, Processing and Mechanical Properties of Functional Hexagonal Materials (2014)

69 "Effects of Substrate Polarity on the Physical Properties of InN Epilayers Grown at Super-Atmospheric Pressures," S. Gamage, R. Kirste, M.K.I. Senevirathna, F. Kaess, M. Bobea, R. Collazo, Z. Sitar, and N. Dietz; MSR Fall Meeting 2014 Symposium AA9: Poster Session: Synthesis, Plasticity, and Theory, poster AA9.13, Dec. 3, 2014, Symposium AA: Synthesis, Processing and Mechanical Properties of Functional Hexagonal Materials (2014)

68 "In Situ Metrology during GaN and InGaN Growth by Remote Plasma-assisted MOCVD," D. Seidlitz, R. Samaraweera, I.T. Ferguson, N. Dietz and A. Hoffmann, Paper# EM-TuP15, Tue. Nov. 11, 2014, session "Electronic Materials and Processing Poster Session," AVS 61st International Symposium; Baltimore, MD, Nov. 9-11, 2014.

67 "Influence of Plasma-Activated Nitrogen Species in MOCVD Grown GaN/GaInN Epilayers," R. Samaraweera, D. Seidlitz, M.K.I. Senevirathna, B. Hussain, I.T. Ferguson, and N. Dietz; Paper# EM-TuP17, Tue. Nov. 11, session "Electronic Materials and Processing Poster Session," AVS 61st International Symposium; Baltimore, MD, Nov. 9-14 2014.

66 "Properties of InN epilayers grown at superatmospheric reactor pressures," S. Gamage, I.M. Senevirathna, B. Kucukgok, B. Hussain, I. Ferguson, and N. Dietz, Symp. SPIE Opt. Eng. & Appl., Aug. 20, 2014, SPIE Paper# 9190-41, 13th Int. Conf. on SSL and LED-based Illumin. Systems; San Diego, CA (2014).

65 "Structural and optical properties of InN epilayers grown at superatmospheric reactor pressures," S. Gamage, M.K.I. Senevirathna, B. Kucukgok, B. Hussain, I. Ferguson, and N. Dietz; 5th Int. Conf. White LEDs and Solid State Lighting (WLED-5), Poster Presentation, Paper No: A1029, June 1–5, 2014, Samdo2-dong, Jeju City, Jeju-do, Korea.

64 "Real-time optical growth characterization of group III-nitride-alloys during Plasma-Assisted MOCVD," D. Seidlitz, R. Samaraweera, B. Hussain, I. Ferguson, N. Dietz and A. Hoffmann, 5th Int. Symp. Growth of III-Nitrides (ISGN-5), Poster presentation, paper# J27, May 20, 6-8pm, Atlanta, GA (2014).

63 "Growth Temperature and Free Carrier Correlations in InN Studied by FTIR and Photoluminescence," M.K.I. Senevirathna, S.Gamage, R. Samaraweera, M. Bugler, A. Hoffmann, A.G.U. Perera, and N. Dietz, 5th Int. Symp. Growth of III-Nitrides (ISGN-5), Poster presentation, paper# E26, May 19, 6-8pm, Atlanta, GA (2014).

62 "Optoelectronic applications of ultrasmall size InN nanoparticles obtained by laser ablation of high pressure chemical vapor deposition (HPCVD) grown InN thin Film," S. Alkis, B. Tekcan, M. Alevli, N. Dietz, A.K. Okyay, 5th Int. Symp. Growth of III-Nitrides (ISGN-5), Poster presentation, paper# E24, May 19, 6-8pm, Atlanta, GA (2014).

61 Plasma-Assisted MOCVD growth of GaN and InGaN epilayers," R. Samaraweera, D. Seidlitz, B. Hussain, A. Melton, I. Senevirathna,I. Ferguson, and N. Dietz, 5th Int. Symp. Growth of III-Nitrides (ISGN-5), Poster presentation, paper# E8, May 19, 6-8pm, Atlanta, GA (2014).

60 "Structural, optical and electrical properties of InN epilayers grown at super-atmospheric pressures," S. Gamage, M.K.I. Senevirathna, M. Büegler, M.A.R.L. Samaraweera, K. Nanayakkara, A. Hoffman and N. Dietz, 5th Int. Symp. Growth of III-Nitrides (ISGN-5), Poster presentation, paper# E7, May 19, 6-8pm, Atlanta, GA (2014).

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59 "Migration-Enhanced, Remote-Plasma MOVCD Growth of Group III-Nitride Epilayers," R. Samaraweera, F. Güth, A. Melton, K. Nanayakkara, I. Seneviratne, I. Ferguson and N. Dietz; Aug. 27, 2013; Paper# AP2.23; 10th Intern. Conf. on Nitride Semicond. (ICNS10), Aug. 25-30, Washington DC (2013).

58 "Properties of indium-rich InGaN epilayers grown at superatmospheric pressures," S. Gamage, K. Nanayakkara, I. Senevirathna, A. Melton, I. Ferguson, and N. Dietz; Aug. 26, 2013; Paper# AP1.24; 10th Intern. Conf. on Nitride Semicond. (ICNS10), Aug. 25-30, Washington DC (2013).

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57 "Structural and Optoelectrical Properties of InN Epilayers Grown by High-Pressure CVD," A. Acharya, M. Buegler, S. Gamage, N. Dietz, and B. Thoms; Thur. Nov. 01, 2012; Paper EM-ThP5 (Electronic Materials and Processing) at AVS 59th International Symposium, Tampa, FL, 2012.

56 "Structural, Compositional, and Thermal Stability Studies on $In_{1-x}Ga_xN$ Epilayers," N. Dietz, M. Buegler, S. Gamage, M. K. I. Senevirathna, R. Atalay, B. Kucukgok, A. G. Melton, and I. T. Ferguson; Thur. Nov. 01, 2012; Paper EM-ThP6 (Electronic Materials and Processing) at AVS 59th International Symposium, Tampa, FL, 2012.

55 "Effect of the nucleation layer thickness on the physical properties of epitaxial InN layers" S. Gamage, M.K.I. Senevirathna, R. Atalay, A. G. Melton, I.T. Ferguson and N. Dietz; Twelfth International Conference on Solid State Lighting; Conference OP220; August 2012, San Diego, CA, poster# 8484-30, Aug. 13, 5-7:30pm (2012).

54 "Atomic Layer Epitaxy of InN Films," N. Mahadik, J. K. Hite, M. A. Mastro, C. R. Eddy, Jr., N. Nepal, M. Currie, S. Gamage, I. Senevirathna, N. Dietz, Poster Session A, Tuesday, June 19th; 12th International Conference on Atomic Layer Deposition (ALD 2012), Dresden Germany, June17-20, 2012.

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53 "The Influence of the Layer Thickness on the Optoelectronic Properties of InN" Indika Senevirathna, S. Gamage, R. Atalay, J.-I. Hong, N. Dietz, and U. Perera, Thu. Nov. 03, Presentation # EM-ThP-10 (Electronic Materials and Processing) at AVS 58th International Symposium, Nashville TN, Oct. 31 - Nov. 04, 2011.

52 "The Effect of Reactor Pressure on the Optoelectronic Properties of InN Epilayers Grown by HPCVD" Indika Senevirathna, S. Gamage, Max Buegler, R. Atalay, J.-I. Hong, N. Dietz, and U. Perera, Presentation # EM-ThP-11 (Electronic Materials and Processing) at AVS 58th International Symposium, Nashville TN, Oct. 31 - Nov. 04, 2011.

51 "The Influence of Ammonia - MO Precursors Pulse Separation on the Gallium Incorporation in Indium-Rich $In_xGa_{1-x}N$ Epilayers" Sampath Gamage, R. Atalay, I. Senevirathna, J. Tweedie, R. Collazo and N. Dietz, Presentation # EM-ThP-13 (Electronic Materials and Processing) at AVS 58th International Symposium, Nashville TN, Oct. 31 - Nov. 04, 2011.

50 "Thermal Stability of HPCVD Grown InN Epilayers" Ananta Acharya, S. Gamage, N. Dietz and B. Thoms, Presentation # EM-ThP-14 (Electronic Materials and Processing) at AVS 58th International Symposium, Nashville TN, Oct. 31 - Nov. 04, 2011.

49 "Substrate Template and V/III-Ratio Effects on the Surface and Structural Properties of HPCVD Grown InN Films" A. Acharya, M. Buegler; R. Atalay; S. Gamage; J. Tweedie, R. Collazo, N. Dietz and B. Thoms, Presentation # EM-ThP-15 (Electronic Materials and Processing) at AVS 58th International Symposium, Nashville TN, Oct. 31 - Nov. 04, 2011.

48 "Digital precursor injection approach for improved indium-rich InGaN layers grown by HPCVD," N. Dietz, R. Atalay, M. Buegler, S. Gamage, R. Kirste, M.K.I. Senevirathna, I. Ferguson, J. Tweedie, R. Collazo, Z. Sitar, and A. Hoffmann; Poster# PB2.04, Tuesday, July 12, 2011, 9th International Conference on Nitride Semiconductors, Glasgow UK (2011).

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47 "The Relationship between Surface Termination and Crystal Structure for HPCVD-grown InN Layers," A.R. Acharya, M. Buegler, R. Atalay, J.S. Tweedie, R. Collazo, N. Dietz, B.D. Thoms, Paper EM-TuP2 (Electronic Materials and Processing Poster Session, Tuesday, October 19, 2010), AVS 57th International Symposium, Albuquerque, New Mexico, Oct. 17-22, 2010.

46 "Free Carrier Concentration Analysis in InN and Indium-rich InGaN Epilayers," R. Kirste, S. Mohn, M. Buegler, R. Atalay, J. Wang, I. Senevirathna, S. Gamage, T. Xu, M. Jamil, I. Ferguson, N. Dietz, A. Hoffmann, International Workshop on Nitride Semiconductors (IWNS2010), Tampa FL Sept. 19-24, 2010, Poster id 904278, 4:30-7:00pm; Sept. 22, 2010.

45 "The Influence of the Reactor Pressure on the Growth Temperature of InN Epilayers and their Physical Properties," S. Gamage, R. Atalay, M. Buegler, I. Senevirathna, J. Wang, R. Kirste, S. Mohn, T. Xu, M. Jamil, I. Ferguson, A. Hoffmann, and N. Dietz, International Workshop on Nitride Semiconductors (IWNS2010), Tampa FL Sept. 19-24, 2010, Poster id 904314, 3:30-6:30pm; Sept. 20, 2010.

44 "Influence of Reactor Pressure on the Phase Stability of Indium-Rich $In_{1-x}Ga_xN$ Epilayers," M. Buegler, R. Atalay, S. Gamage, I. Senevirathna, J. Wang, M. Jamil, I. Ferguson, R. Collazo, Z. Sitar, and N. Dietz - at 15th International Conference on Metal Organic Vapor Phase Epitaxy, Hyatt Regency, Lake Tahoe, May 27, 2010.

43 "The Characterization of Indium-rich InGaN Alloys Grown by High-pressure CVD," N. Dietz, M. Alevli, R. Atalay, M. Buegler, G. Durkaya, R. Kirste, J.-H. Schulze and A. Hoffmann, paper I5.21; in "II-Nitride Growth, Doping, and Device Processing," December 1, 2009 8:00pm, MRS Fall meeting, Boston MA Nov. 30 - Dec. 04 (2009).

42 "Structural studies on the phase stability of $In_{1-x}Ga_xN$ layers," G. Durkaya, R. Atalay, M. Buegler, M. Alevli, M. Jamil, I. Ferguson, and N. Dietz, 76th Annual Meeting SESAPS, LA.00014, Nov. 13, 2009; Atlanta, Georgia (2009).

41 "Composition and Structure of HPCVD-grown InGaN", A. Acharya, M. Buegler, G. Durkaya, B. Thoms, and N. Dietz, 76th Annual Meeting SESAPS, LA.00017, Nov. 13, 2009; Atlanta, Georgia (2009).

40 "Optical Properties of Indium-Rich InGaN Alloys Grown by HPCVD," M. Buegler, R. Atalay, G. Durkaya, E. Malguth, J. Wang, O. Hitzemann, M. Kaiser, R. Kirste, A. Hoffmann, N. Dietz, paper MP156, 5:45pm-19:45pm, Oct. 19, 2009 at 8th International Conference on Nitride Semiconductors (ICNS-8), ICC Jeju, Jeju, Korea, October 18-23 (2009).

39 "Optical and structural properties of InN grown by HPCVD," M. Alevli, M. Buegler, G. Durkaya, E. Malguth, J. Wang, I.T. Ferguson, and N. Dietz, SPIE - Optics & Photonics, San Diego CA, 2-6 Aug. 2009, Ninth International Conference on Solid State Lighting, Poster Session, Paper 7422-42, 8-10am, 4th August (2009).

38 "Optical and structural analysis of $In_{1-x}Ga_xN$ layers grown by HPCVD," M. Buegler, G. Durkaya, E. Malguth, J. Wang, W. Fenwick, I. Ferguson, and N. Dietz, E-MRS June 8 - 12, 2009, Strasbourg, France, Symposium J - Group III nitride semiconductors, June 10 (2009).

37 "Growth and characterization of InN and indium-rich $In_{1-x}Ga_xN$ by high-pressure CVD," Nikolaus Dietz, M. Alevli, R. Atalay, M. Buegler, G. Durkaya, E. Malguth, J. Wang, W. Fenwick, M. Jamil, and I. Ferguson, Air Force Office of Scientific Research, Joint Electronics Program Review, 27-29 May 2009, Arlington, VA 22203 (2009).

36 "Optical and structural analysis of $In_{1-x}Ga_xN$ alloys grown by HPCVD," G. Durkaya, M. Buegler, E. Malguth, W. Fenwick, I. Ferguson, and N. Dietz, 2009 MRS Spring Meeting, San Francisco, CA, April 14-16, 2009, Abstract ID# M8.11, Symposium M: Thin-Film Compound Semiconductor Photovoltaics, April 16 (2009).

35 "Optical and structural analysis of $In_{1-x}Ga_xN$ alloys grown by HPCVD," G. Durkaya, M. Buegler, E. Malguth, W. Fenwick, I. Ferguson and N. Dietz, 2009 APS March Meeting, Session K1, Abstract: K1.00206, Pittsburgh, Pennsylvania, March 20 (2009).

34 "Role of Adsorbates in Surface Electron Accumulation on InN Films," R. P. Bhatta, A. R. Acharya, B. D. Thoms, M. Alevli, and N. Dietz, AVS 55th International Symposium, Boston, MA, Oct. 19-24, 2008.

33 "The growth of InN and indium-rich InGaN alloys by high-pressure CVD," M. Buegler, R. Atalay, J.-H. Schulze, R. Collazo, Z. Sitar, A. Hoffmann, and N. Dietz, Mo2a-P12, at IWN2008, Montreux, Switzerland, Oct. 6-12, 2008.

32 "Optical Properties of InN Grown on Templates with Controlled Surface Polarities," R. Kirste, M. Buegler, J.-H. Schulze, N. Dietz, and A. Hoffmann, Mo2a-P3 at IWN2008, Montreux, Switzerland, Oct. 6-12, 2008.

31 "Surface Morphological Studies of Nerve Cells by AFM," G. Durkaya, N. Dietz and V. Rehder, GSU Molecular Basis of Disease Research Day, May 16 (2008).

30 "Structure of Isolated Oxygen Impurity States in InN," D. Alexandrov; S. Butcher, and N. Dietz; MRS Symp. Q: Nitrides and Related Bulk Materials; Nov. 25-30, 2007; Boston, MA (Session Q9.15, Thu, Nov 29, 8 - 11 pm).

29 "Micro-Raman Analysis on InN Layers Grown by HPCVD," Ronny Kirste; Mustafa Alevli; Nikolaus Dietz; and Axel Hoffmann; at 7th Int'l Conference on Nitride Semiconductors (ICNS-7) Sept 16-21, 2007, LasVegas, Nevada (Wednesday, September 19, 2007 (1:30-2:30 pm).

28 "Surface Morphological Studies of Nerve Cells by AFM," Goksel Durkaya, Kristy Welshhans, Hui Zhao, Vincent Rehder and Nikolaus Dietz, Molecular Basis of Disease (MDB) Program Day 2007, GSU, May 18, 2007.

27 "Surface termination and electron accumulation of InN layers studied by HREELS and LEED," R. P. Bhatta, B. D. Thoms, M. Alevli, and N. Dietz, 2006 MRS Fall Meeting, Symp. I: Advances in III-V Nitride Semiconductor Materials and Devices, Session I7.42, Tue. 8pm, Nov. 27 - Dec. 1, 2006, Boston, MA (2006).

26 "Surface Characterization of Indium Nitride Layers Grown by High Pressure Chemical Vapor Deposition," R. P. Bhatta, B. D. Thoms, A. Weerasekera, A. G. U. Perera, M. Alevli, and N. Dietz, 53rd AVS 2006, Nov. 12-17, 2006, Moscone West Convention Center, San Francisco, CA, paper SS-TuP14 (2006).

25 "The Structural and Optical Properties of InN layers grown by High Pressure CVD," M. Alevli, G. Durkaya, W. Fenwick, A. Weerasekera, V. T. Woods, U. Perera, I.T. Ferguson and N. Dietz, 53rd AVS 2006, Nov. 12-17, 2006, Moscone West Convention Center, San Francisco, CA, paper M-ThP12 (2006).

24 "Optical and structural properties of InN layers grown by high-pressure CVD," N. Dietz, M. Alevli, G. Durkaya, W. Fenwick, V. Woods, I. Ferguson, A. Hoffmann, 28th International Conference on the Physics of Semiconductors July 24-28, 2006, Vienna, Austria, paper FrM2q.10, Friday 11am-12:30 (2006).

23 "Cu induced optical transitions in MOCVD grown Cu doped GaN," J. Senawiratne, M. Strasburg, and N. Dietz, A. Payne, A. Asghar, W. Fenwick, N. Li, and I. T. Ferguson, MRS Fall Meeting 2005, Boston MA, USA; Symposium FF 23.8, Thur. 8:00 pm, December 01, 2005.

22 "The Growth and Characterization of InN Films Grown by High-Pressure CVD," V. Woods, M. Alevli, J. Senawiratne, M. Strassburg and N. Dietz, AVS 52nd Int. Symp., Oct. 30 - Nov. 4, 2005; Hynes Convention Center; Boston, MA, Abstract# 932 (2005).

21 "Raman investigations on InN layers grown under HPCVD conditions," Jayantha Senawiratne, Mustafa Alevli, Vincent Woods, Ute Haboeck, Axel Hoffmann and Nikolaus Dietz, OISE-2005; Oct. 6–7, 2005, Atlanta, GA, USA; presentation # P-6 Thur. Oct. 6, 12:00-1:30 PM (2005).

20 "Real-time optical monitoring of InN growth under high-pressure CVD conditions," Mustafa Alevli, Vincent Woods, Beatriz H. Cardelino and Nikolaus Dietz, OISE-2005; Oct. 6–7, 2005, Atlanta, GA, USA; presentation # P-7 Thur. Oct. 6, 12:00-1:30 PM (2005).

19 "The growth and characterization of InN by high-pressure CVD," V. Woods, M. Alevli, J. Senawiratne, M. Strassburg, A. Hoffmann, and N. Dietz, 6th International Conference on Nitride Semiconductors, Bremen (GER), Aug. 28 - Sept. 2, 2005; Tu-P-082.

18 "Optical, structural and electrical properties of GaN in situ doped with Cu," M. Strassburg, J. Senawiratne, A. M. Payne, A. Asghar, W. E. Fenwick, N. Li, M. Wagner, A. Hoffmann, N. Dietz, and I. T. Ferguson, 6th International Conference on Nitride Semiconductors, Bremen (GER), Aug. 28 - Sept. 2, 2005; Th-P-100.

17 "Alloying, co-doping, and annealing effects on the magnetic and optical properties on MOCVD-grown GaMnN," M. H. Kane, M. Strassburg, A. Asghar, J. Senawiratne, C. J. Summers, Q. Song, Z. J. Zhang, N. Dietz, and I. T. Ferguson, E-MRS Spring meeting 2005, Congress Center, Strasbourg, France; May 31 - June 3, 2005, Session "Electronic and Photonics B - Spintronics".

16 "Optical characterization of high quality AlN single crystals," N. Dietz, J. Senawiratne, M. Strassburg, U. Haboeck, A. Hoffmann, V. Noveski, R. Dalmau, R. Schlesser, and Z. Sitar; MRS Fall 2004 Meeting, Symposium E GaN, AlN, InN, and Their Alloys, ID# E3.36, Boston, MA, Nov. 29 - Dec. 3, 2004.

15 "Preferred Valence States of Chromium, Iron and Manganese Impurities and their Location in the $ZnGeP_2$ Lattice," W. Gehlhoff, D. Azamat, A. Hoffmann, and N. Dietz, 14th International Conference on Ternary and Multinary Compounds, Denver, Colorado, Sept. 27 - Oct. 01, 2004.

14 "Effects of Cu-ion implantation into epitaxial (Ga,Al)N films grown by metalorganic vapor deposition," Z.C. Feng, D. Mehta, P.D. Helm, D. Nicol, I. Fergurson, J. Senawiratne and N. Dietz; MRS Fall Meeting in Symposium Y / Y10.44, Boston, MA, Dec. 1-5, 2003.

13 "Real-Time Optical Monitoring of InN Gas Phase Kinetics at Elevated Pressures," N. Dietz, H. Born, M. Strassburg and V. Woods, MRS Fall Meeting in Symposium Y / Y10.45, Boston, MA, Dec. 1-5, 2003.

12 "Real-time optical Monitoring of Gas-Phase Kinetics in InN Vapor Phase Epitaxy at High Pressures," V. Woods and N. Dietz, MRS Fall Meeting in Symposium L3, Boston, MA, Dec. 1-6, 2002.

11 "Real-time optical monitoring and simulations of gas phase kinetics in InN vapor phase epitaxy at high pressure," N. Dietz, V. Woods, S.D. McCall, and K.J. Bachmann, NASA Microgravity Conference, Huntsville, AL, June 24-26, 2002.

10 "Real-time optical Characterization and Control of Heteroepitaxial $Ga_XIn_{1-X}P$ Growth by P-Polarized Reflectance," N. Dietz, K. Ito, I. Lauko, and V. Woods, MRS Fall 1999 Meeting, Symposium 'Nondestructive Methods for Materials Characterization', Nov 29-Dec 3, 1999.

9 "Real-time Monitoring of GaP Heterostructures by p-Polarized Reflectance," N. Dietz and K. Ito, ICSE-2; 12-15 May 1997; Charleston SC (1997).

8 "Real-time investigation of single and multiple GaP-GaN Heterostructures on Si(100) substrates," N. Dietz, N. Sukidi, C. Harris and K.J. Bachmann, MRS Fall Meeting in Symposium Cb, Thin Films - Structure and Morphology, Boston, December, 2-6, 1996.

7 "Real-Time Optical Monitoring of $Ga_XIn_{1-X}P$/GaP on Silicon Heterostructures," N. Dietz, U. Rossow, D. E. Aspnes and K.J. Bachmann, MRS Fall Meeting in Symposium L, Diagnostic Techniques for Semiconductor Materials Processing, Boston Nov. 28, 1995.

6 "Real-Time Optical Monitoring of Epitaxial Growth Processes on Si under Pulsed Chemical Beam Conditions," N. Dietz, U. Rossow, D. E. Aspnes and K.J. Bachmann, ACSI-3 at the Third International Symposium on Atomically Controlled Surfaces and Interfaces, North Carolina State University, October 12-14, 1995

5 "Real-Time Process Monitoring under the Condition of Pulsed Chemical Beam Epitaxy of GaP on Si(001)," in 'New Materials for Science and Technology', N. Dietz, A.E. Miller and K.J. Bachmann, Material Research Society, Nov. 18 1994, Microelectronic Center of North Carolina, RTP, NC (1994).

4 "Selective Migration-Enhanced Chemical Beam Epitaxy of GaP on Si(001)," N. Dietz, A.E. Miller, J.T. Kelliher, D. Venables and K.J. Bachmann, Eight International Conference of Molecular Beam Epitaxy, Aug.29-Sept.2, 1994, Osaka, Japan (1994).

3 "A New Optical Method of Characterize Layer Growth," N. Dietz and H.J. Lewerenz; International Conference on Electronic Materials, Symposium B, June 2-5, 1992; Strasbourg, France.

2 "Optical defect characterization on $CuInS_2$ grown under elevated pressures," N. Dietz, M.L. Fearheiley and H.J. Lewerenz; International Conference on Advanced Materials and Symposium on Non-stochiometry in Semiconductors, May 27-31, 1991; Strasbourg, France.

1 "Reflexionsspektroskopische Untersuchungen an $Cd_xZn_yMn_zTe$ im Temperaturbereich von 20 bis 300K," N. Dietz, Th. Bitzer, H.-E. Gumlich, Ch. Jung, A. Krost, Verhandl. DPG 23, HL - 11.81, 1988; Frühjahrstagung der DPG, Arbeitskreis Festkörperphysik, Karlsruhe 1988.

C.V.
D. G. SUMITH P. DOLUWEERA

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EDUCATION

University of Cincinnati, OH, 45221
Ph.D. in Computational condensed matter physics 2008

Area of study: Inhomogeneity and High Temperature Superconductivity in strongly correlated electronic systems
Advisor: Prof. Mark Jarrell

University of Cincinnati, OH, 45221
M.S. in Physics 12/2003

University of Ruhuna, Matara, Sri Lanka
B.Sc. in Physics – First Class Honors 12/1994
Minor: Mathematics

Technician Training Institute, Katunayake, Sri Lanka
National Diploma In Engineering Sciences 05/1991
Specialization: Mechanical Engineering- Automotive

AWARDS

- University Graduate scholarship, Dept. of Physics, University of Cincinnati 09/2000-12/2007
- Gold medal award for the "Best Physical Science Student in 1994", University of Ruhuna, Matara, Sri Lanka 1995

TEACHING EXPERIENCE

Georgia State University, Atlanta, GA
Department of Physics and Astronomy

Lecturer 08/2009-07/2015
Senior Lecturer 08/2015-to date

- Calculus and Algebra based Introductory physics: both traditional and SCALE-UP teaching formats- Interactive teaching recommended by Physics Education research community. Use of disire2Learn/icollege Course Management system, Online Mastering Physics Homework, making physics video lectures, high school physics teachers to teach physics.
- Reforming and redesigning Calculus based physics labs 06/2013 -to date
- Physics Lower Division Advisor 08/2015- to date

ECPI Online University, Virginia Beach, VA 23462

Online Adjunct instructor in Physics 07/2012-to date

Indiana University-Purdue University Fort Wayne, IN
Department of Physics

Visiting Assistant Professor 08/2008-08/2009
Conceptual Physics, Physics of Sports, General Physics and Labs Summer 2009
(Interactive teaching recommended by PER) Spring 2009

Visiting Instructor
Conceptual Physics, Physics of Sports and physics Labs Fall 2008

University of Cincinnati 01/2008-03/2008
Department of Mathematics
Adjunct Instructor
Mathematica based Calculus Lab for undergraduates

University of Cincinnati
Department of physics
Teaching Assistant/ Lab instructor 09/2004-06/2007
09/2000-08/2002

Graded graduate (Quantum Mechanics, Statistical Mechanics, Solid State Physics) assignments/exams, Conducted College and General physics lab classes and recitations.

University of Ruhuna, Matara, Sri Lanka
Department of Physics

Temporary Assistant Lecturer 02/1995-07/1996

- Lectured undergraduate physics courses
- Supervised undergraduate physics labs

RESEARCH EXPERIENCE

University of Cincinnati, Department of Physics
Research Assistant Research related to inhomogeneity and high temperature superconductivity using Dynamical Cluster Quantum Monte Carlo Approximation — 04/2008-08/2008, 07/2007-12/2007

Institute of Theoretical Physics, University of Goettingen, Goettingen, Germany
Scientific Employee: Code development / simulation of two chain Hubbard model using Dynamical Cluster Quantum Monte Carlo Approximation — 02/2004 -08/2004

University of Cincinnati
Research Assistant — 09/2002- 01/2004
Research on the use of Maximum Entropy method/Bayesian statistics for analytic continuation of Quantum Monte Carlo data with sign problem

National Aquatic Resources Research and Development agency, Colombo, Sri Lanka
Research Officer — 08/1996 - 08/2000
Carried out duties related to Fishing Technology Division of the agency such as development of existing fishing gears

PROFESSIONAL DEVELOPMENT, SREVICE & OTHER

- Physics Lower Division Advisor — 08/2015- to date
- Member: College NTT Promotion Committee — 08/2015-07/2016
- Member: P &A Executive Committee — 08/2015-to date
- Member: Department Curriculum Committee — 2013-todate
- Section Representative: Southern Atlantic Coast Section: American Association of Physics Teachers — 2016 to date
- Participated in AAPT summer meeting Sacramento, CA — 07/16/2016, 07/20/2016
- Participated in the PhysTEC summer Retreat, GSU, Atlanta — 07/07/2016
- Participated in 2016 PhysTEC conference — 03/11/2016, 03/13/2016
- Participated in SAAC-AAPT meeting, Clayton State University, Morrow, GA — 04/15/2016, 04/16/2016
- Co-Event leader for the "Crave the Wave" section of the Georgia Science Olympiad competition at Georgia State University — 03/05/2016
- Participated in SAAC-AAPT regional meeting at Citadel, in Charleston, SC — 10/30/2015, 10/31/2015
- Participated in the Physics Education Research Conference, AAPT, Summer meeting in College park, MD — 07/30/2015, 07/31/2015
- Participated in American Association of Physics Teachers Summer meeting in College Park, MD, and attended workshop " Modeling Instruction for University Physics" — 07/26/2015, 07/29/2015
- Co-Event leader for the "Shock Value" section of the Georgia Science Olympiad competition at Georgia State University — 02/14/2015
- Attended in SACS-AAPT regional meeting held at College of Charleston, South Carolina, Charlotte, SC. — 10/24/2014, 10/25/2014
- Attended in the Physics Education Research Conference, AAPT, Summer meeting in Minneapolis, MN — 07/30/2014, 07/31/2014

• Participated in American Association of Physics Teachers Summer meeting in Minneapolis MN and attended two workshops. Writing new problems for introductory physics classes and on introductory physics labs	07/26/2014 07/30/2014
• Co-Event leader for the "Shock Value" section of the Georgia Science Olympiad competition at Georgia State University	03/08/2014
• Attended the one-day workshop on "Flipped Classroom" conducted by Dr. Leigh Smith at Georgia State university,	08/19/2013
• Co-Event leader for the "Shock Value" section of the Georgia Science Olympiad competition at Georgia State University	02/26/2013
• Member : Physics Lecturer search committee	2011-2012
• Member: Department committee on Phys1111/1112 -Curriculum development committee for Introductory physics	2011-2012
• Co-Event leader for the "Keep the Heat" section of the Georgia Science Olympiad competition at Georgia State University	02/18/2012
• Participated in AAPT regional meeting Ashville. North Carolina Section of the American Association of Physics Teachers, Ashville, TN.	11/18/2011 11/19/2011
• Participated in PKAL meeting "Collecting and Sharing Evidence of Student Learning in STEM", University of North Georgia	04/15/2011
• Co-Event leader for the "Shock Value" section of the Georgia Science Olympiad competition at Georgia State University	02/19/2011
• Participated in the workshop conducted by the Center for Teaching and Learning at the Exchange, GSU, about "Teaching with Technology" a) Hybrid courses, b)Tools for online services	11/2010
• Co-Event leader for the "Shock Value" section of the, Georgia Science Olympiad competition at Georgia State University	02/27/2010
• Event leader for the experimental design, Science Olympiad • (Div C), Indiana regional competition at Indiana University	02/2009
• Perdue university Fort Wayne • Served as an instructor to the "Physics by inquiry" course conducted by the University of Cincinnati for elementary school teachers.	Summer 2008
• Attended the seminar course "Preparing Future Faculty" conducted by the university of Cincinnati	Fall 2005
• President of the "Physics Graduate Student Association"	2005-2006
• Attended the workshop on "Parallel Programming with MPI" conducted by the Ohio Supercomputer Center, Columbus, Ohio	05/29-30/2003

GRANTS RECEIVED

1. **STEM mini-grant**

   Flipped Class: How do students view it and does it make a difference in learning? Reading the Textbook before the lecture: Does it matter? $1200.00, D. Sumith Doluweera(PI). — Spring 2014

2. **GSU grant:** Hybrid Pedagogies: Flipping the SCALE-UP Studio: Sponsored by Georgia State University - Office of the Provost, Georgia State University. Introductory Physics Flipped class project for creating video lecture series for SCALE-UP Introductory Physics classes (Phys1111K and Phys1112K) to improve student learning. Joshua Von Korff(PI), Brian D. Thoms(Co-PI), *D. Sumith Doluweera*(Co-PI), John Richard Evans(Co-PI), Deepak Raghavan(Co-PI) and Ruili Wang(Co-PI).($40000.00). From 9/2013-08/2015 — 08/2013

3. **External Grant:** Received PhysTEC grant: "PhysTEC Comprehensive Site at Georgia State University." Brian Thoms(PI), Brett Criswell(Co-PI), *Sumith Doluweera*, Joshua Von Korff, $300,000.00. From 08/2013-07/2016 — 03/2013

4. **STEM mini-grant**

   "Promoting Conceptual Change: Supporting the Physics Content Development of Pre-Service Teachers" Kadir Demir (PI), Brett Criswell (Co-PI), (Department of Middle-Secondary Education and Instructional Technology), *Sumith Dulaweera* (Co-PI) ($5000.00) — Summer 2012

5. **STEM mini grant: Graduate level course development** — Summer 2011

   "Creating a Formula for preparing better Physics Teachers in Georgia" for secondary school teachers. D. Sumith Doluweera(PI), Brett Criswell (Co-PI),(Department of Middle-Secondary Education and Instructional Technology, College of Education, Georgia state university') ($4000.00)

6. **Computer time allocation Grant (**$100,000) from The Ohio Supercomputer center for "A Study Employing Dynamical Cluster Approximation- Effect of Charge Inhomogeneity on the superconducting Transition Temperature in Cuprate Superconductors. (M. Jarrell, *D.G.S.P Doluweera,* A. Macridin, T. A. Maier and Th. Pruschke.) — 12/2006

PUBLICATIONS

1. A.Macridin, **S. P. Doluweera**, M. Jarrell and Th. Maier, "Analytic continuation of QMC data with sign problem" :cond-mat/0410098(2004)

2. M.A. Majid, **D. G. S. P. Doluweera**, B. Moritz, and P.R.C. Kent, J. Moreno and M. Jarrell "Charge Density Wave Driven Ferromagnetism in the Periodic Anderson Model": arXiv:0710.5937, (2007)

3. **D. G. S. P. Doluweera**, M. Jarrell, T. A. Maier, A. Macridin and Th. Pruschke "Suppression of d-wave superconductivity in the checkerboard Hubbard model"
   Phys. Rev. B, **78**, 020504(R) (2008)

4. M. Jarrell, A. Macridin, K. Mikelsons, **D. G. S. P. Doluweera**, J. E. Gubernatis, "The Dynamical Cluster Approximation with Quantum Monte Carlo Cluster Solvers", Lectures on the Physics of Strongly Correlated Systems XII, AIP Conference Proc., Eds. A. Avella and F. Mancini, **1034**, 34 (2008)

5. A. F. Kemper, **D. G. S. P. Doluweera**, T. A. Maier, M. Jarrell, P. J. Hirschfeld and H- P. Cheng, "Insensitivity of superconductivity to disorder in the cuprates"
   Phys. Rev. B, **79**, 104502 (2009)

PRESENTATIONS, GUEST LECTURES AND TALKS

- Demonstrated one of the re-designed calculus based labs (Simple Harmonic Motion) at the "Introductory Physics Lab workshop" conducted by AAPT during the AAPT Summer 2016 meeting, Sacramento, CA.

- Contributed Talk on "Student's Understanding of Centripetal Acceleration" as Evidenced by Answers to a Guided Inquiry-based lab", D. G. Sumith P Doluweera, Brian D Thoms, Joshua Von Korff, and Carola Butler, AAPT Summer 2016 meeting, Sacramento, CA, 07/20/2016.

- Contributed talk on "Mechanical Equilibrium", D.G.S.P.Doluweera and B.D.Thoms, SAAC-AAPT regional meeting at Citadel, Charleston, SC, October 30-31,2015

- Presented a poster on "Reforming Calculus based introductory physics at Georgia State University and its effect on student learning",D.G.S.P.Doluweera, B.D.Thoms, J.Von Kroff, 2015 Physics Education Research Conference, College Park, MD, July 27, 2015

- Contributed talk, Reforming Calculus based introductory physics at Georgia State University and its effect on student learning", D.G.S.P.Doluweera, B.D.Thoms, J.Von kroff, 2015 AAPT Summer meeting, College Park, MD July 27, 2015

- Contributed talk, "Measuring Centripetal Acceleration with a Liquid Accelerometer", D.G.S.P.Doluweera, B.D.Thoms, O.I.Olesya, M.Rusert, C.Butler, and J.Von Korff 2014 AAPT Summer Meeting, Minneapolis, MN, July 28, 2014
- B.D. Thoms presented "Undergraduate Pathway to Teaching Physics at Georgia State University," B. D. Thoms, M. E. Walker, S. Doluweera, and J. Von Korff, 2014 Winter AAPT Meeting, Orlando, FL, January 4-7/2014.

- Did a guest lecture about "Trajectories beyond freefall" for the "Neuroscience" class, at Georgia State University" November 2013.

- B.D. Thoms presented "Undergraduate Pathway to Teaching Physics at Georgia State University, " B. D. Thoms, M. E. Walker, S. Doluweera, and J. Von Korff, 2013 Fall SAAC- AAPT Meeting, Greenville, SC. October 25-26, 2013.

- Guest lecture about "Quantum Computing" for the Gateway to Physics class at
- Georgia State University, October 2012
- "Improving Future High School Physics Teachers' Preparedness", Presented a poster to the AAPT regional meeting Nashville. North Carolina Section of the American Association of Physics Teachers, Ashville, TN. 11/18-19/2011.

- High Temperature Superconductivity: Department of Physics, Indiana University- Purdue University, Fort Wayne, IN, Physics Society Meeting, 11/02/2008.

- Contributed Talk "Suppression of d-wave superconductivity in the weakly inhomogeneous checkerboard Hubbard model", American Physical Society March Meeting, New Orleans, LA: 03/12/2008.

COMPUTATIONAL PHYSICS SKILLS

- Quantum Monte Carlo (Hirsh-Fye) simulations
- Dynamical Mean Field Theory (DMFT)
- Dynamical Cluster Approximation (DCA)
- Maximum Entropy Method and inverse problem solving
- Exact diagonalization

COMPUTOR SKILLS

Platforms: Unix, Linux, MPI, Windows, Mac

Languages: Fortran 77/90/95, C, C++, shell scripting, Java, python

Numerical Libraries: LAPACK, BLAS, PBLAS, Intel MKL, Matlab

Other: CVS, serial and massively parallel programming, Mathematica

Teaching related software : CPS and blackboard, Data Studio, Logger Pro, Learning Catalytic.

PROJECTS COMPLETED AND PRESENTED AS COURSE REQUIREMENTS

- "Physical implementation of qubits using superconducting components", presented as a partial requirement of the course of "Special Topics in Quantum Computing", University of Cincinnati, Spring 2005

- "The role of Electric Polarization in Nonlinear Optics", presented for solid state physics course, University of Cincinnati - Fall 20021

- "Electronic Properties of GaNAs alloy", presented for solid state physics course, University of Cincinnati, Spring 2002

PROFESSIONAL MEMBERSHIP

Member of the American Association Physics Teachers from 2009 to date

John Richard Evans
1737 Linwood Ave.
East Point, GA 30344
Home Phone: (404) 767-8542
Office phone: (404) 413-6076
Email: jre@gsu.edu

Thesis: Turbulence and Spatial Correlation of Currents
in Quantum Chaos.
Thesis advisor was Dr. Mark Stockman.

Education

Georgia State University Ph.D. Physics
Atlanta Georgia

Sam Houston State University B.S. Physics
Huntsville Texas

Workshops in Physics Education:

1. SCALE UP by Robert Beichner (NCSU)
2. Modeling methods in physics education by David Hestenes (ASU)
3. Vpython in physics education by Bruce Sherwood (NCSU)
4. Positive Effect of Active Learning (GSU) Panel Member
5. Summer(2008) workshop Matter and Interactions curriculum (GTech)

Instructional Funding

STEM Fellow- summer funding (2008-2010):

Internal STEM grant summer (2011): **Title of Project:** Redesign of college physics for biological science majors (part I)
Internal STEM grant summer (2012): **Title of Project:** Redesign of college physics for biological science majors

Work Experience:
Orlando Science Center
Associate Director
Associate Director of Science Education
Director: Dr. Phillips Open Physics Lab (2003-2004)
Orlando Fl

Books:

Evans, J. R. *interactive physics work book.* (3st ed.). New York: Pearson.

Evans, J. R. *interactive pre-calculus book.*. (3st ed.)Pearson.

Evans, J. R. *interactive statistics book.*. (3st ed.)Pearson

Teaching Experience:

Georgia State University
Atlanta Georgia
Department of Physics and Astronomy
Senior Lecturer 2014-present
Lecturer 2008-2013
Visiting Lecturer 2007-2008
Agnes Scott College
Decatur Georgia
Department of Physics and Astronomy
Part time Assistant Professor 2004-2007

Course taught

Lab 110 and 111
First year seminar
Scientific computing

Georgia Perimeter College
Decatur Georgia
Instructor of Physics 2004-2007

Course taught

Introductory Physics I and II +Labs
Physics for Engineer and Scientist I and II +Labs

Georgia State University
Atlanta Georgia
Department of Physics and Astronomy
Part time instructor summer 2004-2006

Course taught

General Physics 1111 and 1112

University of Central Florida
Orlando Florida
Department of Physics
Visiting Assistant Professor (1999-2003)
SPS faculty advisors

Course taught

Introductory Physics I and II
Physics for Engineer and Scientist I and II
Computer Methods in Physics
Classical Mechanics
Mathematical Physics

Georgia State University
Atlanta Georgia
Department of Physics and Astronomy
Visiting Lecture in Physics (Spring1999-Summer 1999)

Course taught

Introductory Physics I and II
Conceptual Physics I and II
Physics for Visual Arts
Advanced General Physics

Devry University
Atlanta Georgia

Professor of Math/Physics (1987-1995)
Associate Professor of Math/Physics (1984-1987)
Assistant Professor of Math/Physics (1983-1984)

Course taught

Introductory Physics I and II (Calculus bases)
Differential and Integral Calculus
Transform Analysis
Advance circuit analysis
Control Systems I and II
C/C++

DOUGLAS RUSSELL GIES

Academic Address:

Department of Physics & Astronomy
Georgia State University, P.O. Box 5060
Atlanta, GA 30302-5060
Phone: (404) 413-6021
E-Mail: gies@chara.gsu.edu

Home Address:

2644 Ellwood Drive NE
Atlanta, GA 30305-3866
Phone: (404) 261-0126

Date of Birth: 21 May 1955
Citizenship: Canadian/American

EDUCATION

Ph.D. Astronomy University of Toronto, 1985
Thesis: The Binary Frequency of the OB Runaway Stars Supervisor: C. T. Bolton

M.Sc. Astronomy University of Toronto, 1980
Thesis: The Optical Spectrum of HDE 226868 = Cygnus X-1 Supervisor: C. T. Bolton

B.Sc. Physics and Astronomy University of Toronto, 1978

PROFESSIONAL EXPERIENCE

Director of CHARA September 2015 to present
Department of Physics and Astronomy, Georgia State University, Atlanta, GA

Regents' Professor July 2011 to present
Department of Physics and Astronomy, Georgia State University, Atlanta, GA

Director, Astronomy Graduate Program February 2005 to September 2011
Department of Physics and Astronomy, Georgia State University, Atlanta, GA

Professor September 1999 to present
Department of Physics and Astronomy, Georgia State University, Atlanta, GA

Associate Professor September 1994 – August 1999
Department of Physics and Astronomy, Georgia State University, Atlanta, GA

Assistant Professor September 1988 – August 1994
Department of Physics and Astronomy, Georgia State University, Atlanta, GA

Natural Sciences and Engineering Research Council of Canada
Postdoctoral Fellow September 1986 to August 1988
Astronomy Department, University of Texas, Austin, TX

McDonald Observatory Postdoctoral Fellow December 1984 to August 1986
Astronomy Department, University of Texas, Austin, TX

Graduate Student September 1978 to November 1984
David Dunlap Observatory, University of Toronto, Toronto, Canada

ACADEMIC AWARDS

2005	Outstanding Faculty Scholarship Award, GSU College of Arts & Sciences
1993	Outstanding Junior Faculty Award, GSU College of Arts & Sciences
1983-84	University of Toronto Open Doctoral Fellowship
1982-84	IODE War Memorial Graduate Scholarship
1979-82	Natural Sciences and Engineering Research Council Graduate Fellowship
1978-79	Ontario Graduate Fellowship
1978	Royal Astronomical Society of Canada Gold Medal
1977	H. S. Robertson Scholarship in Astronomy

MEMBERSHIPS

American Astronomical Society
Canadian Astronomical Society
Royal Astronomical Society of Canada
International Astronomical Union
Astronomical Society of the Pacific

RESEARCH FIELDS

High resolution spectroscopy and interferometry of hot stars, stellar pulsation, stellar winds and disks, stellar abundances, binary star evolution, dynamics of star clusters

PUBLICATIONS

I. Refereed Papers

1. Gies, D. R., & Percy, J. R. 1977, "Photometric Variability of 29 Cygni," *Astronomical Journal*, **82**, 166-168.

2. Gies, D. R., & Bolton, C. T. 1982, "The Optical Spectrum of HDE 226868 = Cygnus X-1. I. Radial Velocities and Orbital Elements," *Astrophysical Journal*, **260**, 240-248.

3. Gies, D. R., & Bolton, C. T. 1984, "A Search for Periods Longer than 5.6 days in the Optical Spectrum of HDE 226868 = Cygnus X-1," *Astrophysical Journal (Letters)*, **276**, L17-19.

4. Gies, D. R., & Bolton, C. T. 1986, "The Optical Spectrum of HDE 226868 = Cygnus X-1. II. Spectrophotometry and Mass Estimates," *Astrophysical Journal*, **304**, 371-388.

5. Gies, D. R., & Bolton, C. T. 1986, "The Optical Spectrum of HDE 226868 = Cygnus X-1. III. A Focused Stellar Wind Model for He II λ4686 Emission," *Astrophysical Journal*, **304**, 389-393.

6. Gies, D. R., & Bolton, C. T. 1986, "The Binary Frequency and Origin of the OB Runaway Stars," *Astrophysical Journal Supplement Series*, **61**, 419-454.

7. Gies, D. R. 1987, "The Kinematical and Binary Properties of Association and Field O Stars," *Astrophysical Journal Supplement Series*, **64**, 545-563.

8. Gies, D. R., & Kullavanijaya, A. 1988, "The Line Profile Variations of Epsilon Persei. I. Evidence for Multimode Nonradial Pulsations," *Astrophysical Journal*, **326**, 813-831.

9. Bagnuolo, W. G., Jr., Furenlid, I. K., Gies, D. R., Barry, D. J., Russell, W. H., & Dorsey, J. F. 1990, "The Multi–Telescope Telescope: A Cost–Effective Approach to Fiber Fed Spectroscopy," *Publications of the Astronomical Society of the Pacific*, **102**, 604-611.

10. Gies, D. R., McKibben, W. P., Kelton, P. W., Opal, C. B., & Sawyer, S. 1990, "Time Resolved H Alpha Spectroscopy of the Be Star Pleione During a Lunar Occultation," *Astronomical Journal*, **100**, 1601-1609.

11. Fullerton, A. W., Gies, D. R., & Bolton, C. T. 1991, "Detection of Small-Amplitude Pulsations in HD 34656 (O7 II)," *Astrophysical Journal (Letters)*, **368**, L35-38.

12. Gies, D. R., & Wiggs, M. S. 1991, "A Spectroscopic Search for Colliding Stellar Winds in O–Type Close Binary Systems. I. AO Cassiopeiae," *Astrophysical Journal*, **375**, 321-334.

13. Bagnuolo, W. G., Jr., & Gies, D. R. 1991, "Tomographic Separation of Composite Spectra: The Components of the O-Star Spectroscopic Binary AO Cassiopeiae," *Astrophysical Journal*, **376**, 266-271.

14. Bagnuolo, W. G., Jr., Gies, D. R., & Wiggs, M. S. 1992, "Tomographic Separation of Composite Spectra. I. The Components of Plaskett's Star," *Astrophysical Journal*, **385**, 708-717.

15. Gies, D. R., & Lambert, D. L. 1992, "Carbon, Nitrogen, and Oxygen Abundances in Early B-Type Stars," *Astrophysical Journal*, **387**, 673-700.

16. Prinja, R. K., Balona, L. A., Bolton, C. T., Crowe, R. A., Fieldus, M. S., Fullerton, A. W., Gies, D. R., Howarth, I. D., McDavid, D., & Reid, A. H. N. 1992, "Time Series Observations of O Stars. I. IUE Observations of Variability in the Stellar Wind of ζ Puppis," *Astrophysical Journal*, **390**, 266-272.

17. Fullerton, A. W., Gies, D. R., & Bolton, C. T. 1992, "Propagating Absorption Enhancements in the Wind of the Extreme Of Supergiant HD 151804," *Astrophysical Journal*, **390**, 650-660.

18. Wiggs, M. S., & Gies, D. R. 1992, "A Spectroscopic Search for Colliding Stellar Winds in O–Type Close Binary Systems. II. Plaskett's Star (HD 47129)," *Astrophysical Journal*, **396**, 238-250.

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20. Gies, D. R., Willis, C. Y., Penny, L. R., & McDavid, D. 1993, "The He I λ6678 Emission Line of Phi Persei: New Evidence of the Companion Star," *Publications of the Astronomical Society of the Pacific*, **105**, 281-286.

21. Wiggs, M. S., & Gies, D. R. 1993, "A Spectroscopic Search for Colliding Stellar Winds in O–Type Close Binary Systems. III. 29 UW Canis Majoris," *Astrophysical Journal*, **407**, 252-265.

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V. Other Publications

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AWARDS

GSU Research Grant Program
The Origin of the Spectral Line Variations in the star ϵ Per
9/1/88 - 6/30/89 $3,000

GSU Research Grant Program
Stellar Winds in Luminous Close Binary Systems
12/1/88 - 6/30/89 $3,000

Chretien International Research Grant, American Astronomical Society
Pulsation and Mass Loss in O-type Stars
9/19/88 - 9/30/89 $15,000

NASA Astrophysics Data Program Grant Number NAG 5 1218
Colliding Stellar Winds in O-Type Close Binary Systems
8/15/89 - 6/14/91 $33,800

National Science Foundation Grant Number AST-8917740
Rapid Variability in the Spectral Lines of Be Stars
9/15/89 - 8/28/91 $29,612

National Science Foundation Grant Number AST-8916110
A CHARA Spectroscopic Facility
3/1/90 - 8/29/92 $52,900
(P.I.: W. G. Bagnuolo, Jr.; Co-I.: I. K. Furenlid & D. R. Gies)

National Science Foundation Grant Number AST-9115121
Spectral Line Variability in Be and Bn Stars
3/1/92 - 8/31/95 $90,000

National Aeronautics and Space Administration
Astrophysics Data Program
Tomography of Early-Type Close Binary Stars
5/1/92 - 3/31/94 $93,000
(P.I.: W. G. Bagnuolo, Jr.; Co-I.: D. R. Gies)

National Aeronautics and Space Administration
IUE Guest Observer Program
Colliding Winds and Tomography of O-Type Binaries
6/1/92 - 12/31/94 $18,000
(P.I.: D. R. Gies; Co-I.: W. G. Bagnuolo, Jr.)

GSU Quality Improvement Fund Program in Research
A Workstation for the Hard Labor Creek Observatory Multiple-Telescope Telescope
2/19/93 - 10/31/93 $9,305

National Aeronautics and Space Administration
Hubble Space Telescope Cycle 3 Proposal
Boron in Orion
11/15/93 - 11/15/94 $8,525
(P.I.: D. R. Gies; Co-I.: D. L. Lambert, K. Venn, K. Cunha)

National Aeronautics and Space Administration
IUE Guest Observer Program
Tomography and Colliding Winds of O-Type Binaries
1/31/94 - 1/31/95 $1,500
(P.I.: W. G. Bagnuolo, Jr.; Co-I.: D. R. Gies)

GSU Chancellor's Initiative Fund
Research in the Center for High Angular Resolution Astronomy
15/9/90 - 30/6/94 (5 separate awards) $242,960
(P.I.: H. A. McAlister; Co-I.: I. K. Furenlid & D. R. Gies)

GSU Quality Improvement Fund - Instructional Equipment Award
Digital Enhancement of the Astronomy Teaching Lab and Physics & Astronomy Lecture Materials
1/27/95 - 6/30/95 $6,800
(P.I.: D. R. Gies; Co-I.: J. E. Purcell, J. W. Wilson, & D. W. Wingert)

GSU Quality Improvement Fund
Multiplying the Performance of the Multiple-Telescope Telescope
2/6/95 - 6/30/95 $19,326
(P.I.: W. G. Bagnuolo, Jr.; Co-I.: D. R. Gies)

GSU Chancellor's Initiative Fund
Research in the Center for High Angular Resolution Astronomy
7/1/94 - 6/30/95 $60,000
(P.I.: H. A. McAlister; Co-I.: I. K. Furenlid & D. R. Gies)

GSU Chancellor's Initiative Fund
Research in the Center for High Angular Resolution Astronomy
7/1/95 - 6/30/96 $57,100
(P.I.: H. A. McAlister; Co-I.: D. R. Gies, W. G. Bagnuolo, & W. I. Hartkopf)

GSU Chancellor's Initiative Fund
Research in the Center for High Angular Resolution Astronomy
7/1/96 - 6/30/97 $66,100
(P.I.: H. A. McAlister; Co-I.: D. R. Gies, W. G. Bagnuolo, & W. I. Hartkopf, & M. A. Shure)

GSU Research Program Enhancement Program
Research in the Center for High Angular Resolution Astronomy
7/1/97 - 6/30/98 $74,100
(P.I.: H. A. McAlister; Co-I.: D. R. Gies, W. G. Bagnuolo, W. I. Hartkopf, & M. A. Shure)

National Aeronautics and Space Administration
Astrophysics Data Program
IUE Atlas of Reconstructed Spectra of Hot Binary Stars
5/1/95 - 12/31/97 $103,000
(P.I.: D. R. Gies; Co-I.: W. G. Bagnuolo, Jr.)

National Aeronautics and Space Administration
Space Telescope Science Institute
Hubble Space Telescope Cycle 5 Guest Observer Program
A Search for the Helium Companion of Phi Persei

11/1/95 - 10/31/97 $14,736
(P.I.: D. R. Gies; Co-I.: W. G. Bagnuolo, Jr., & D. Barry)

National Aeronautics and Space Administration
Space Telescope Science Institute
Hubble Space Telescope Cycles 5 and 6 Guest Observer Program
The Masses of the O-type Binary 15 Monocerotis
11/1/95 - 10/31/99 $40,535
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National Aeronautics and Space Administration
Space Telescope Science Institute
Hubble Space Telescope Cycle 5 Guest Observer Program
Boron Abundances in Orion and Boron Production in Type II Supernovae
10/1/95 - 4/30/97 $15,610
(P.I.: D. L. Lambert; Co-I.: K. Cunha, L. Roberts, D. R. Gies, & M. Lemke)

National Aeronautics and Space Administration
Space Telescope Science Institute
Hubble Space Telescope Cycle 6 Guest Observer Program
Be + Helium Star Binaries
9/1/96 - 8/31/98 $11,377
(P.I.: D. R. Gies; Co-I.: G. Peters, W. G. Bagnuolo, Jr., A. Kaye, L. Penny, & M. Thaller)

National Aeronautics and Space Administration
Space Telescope Science Institute
Hubble Space Telescope Cycle 7 Guest Observer Program
The Masses of the O-type Binary 15 Monocerotis
4/1/99 - 3/31/01 $26,530
(P.I.: D. R. Gies; Co-I.: B. Mason, W. Hartkopf, W. Bagnuolo, H. McAlister, & W. McKibben)

National Aeronautics and Space Administration
Astrophysics Data Program
Cross-Correlation Analysis of UV Profile Variations and Nonradial Pulsations in Be Stars
2/28/98 - 12/31/01 $87,700
(P.I.: D. R. Gies; Co-I.: G. J. Peters)

GSU Research Program Enhancement Program
Research in the Center for High Angular Resolution Astronomy
7/1/98 - 6/30/99 $74,100
(P.I.: H. A. McAlister; Co-I.: D. R. Gies, W. G. Bagnuolo, W. I. Hartkopf, & M. A. Shure)

National Aeronautics and Space Administration
Space Telescope Science Institute
Hubble Space Telescope Cycle 8 Guest Observer Program
The Masses of the O-type Binary 15 Monocerotis
10/1/00 - 9/30/02 $25,385
(P.I.: D. R. Gies; Co-I.: B. Mason, W. Hartkopf, W. Bagnuolo, & H. McAlister)

National Aeronautics and Space Administration
Space Telescope Science Institute
Hubble Space Telescope Cycle 8 Guest Observer Program
The FUV Spectrum of SS 433
8/1/99 - 7/31/01 $15,609
(P.I.: D. R. Gies; Co-I.: W. Bagnuolo)

GSU Research Program Enhancement Program
Research in the Center for High Angular Resolution Astronomy
7/1/99 - 6/30/00 $74,600
(P.I.: H. A. McAlister; Co-I.: D. R. Gies, W. G. Bagnuolo, W. I. Hartkopf, & M. A. Shure)

National Aeronautics and Space Administration
Space Telescope Science Institute
Hubble Space Telescope Cycle 8 Guest Observer Program
Link Between Massive Binary Stars and Non-thermal Radio Emissions
8/1/99 - 7/31/01 $91,661
(P.I.: D. Wallace; Administrative P.I.: D. R. Gies)

National Aeronautics and Space Administration
Space Telescope Science Institute
Hubble Space Telescope Cycle 9 Guest Observer Program
The Masses of the O-type Binary 15 Monocerotis
1/1/01 - 12/31/02 $28,240
(P.I.: D. R. Gies; Co-I.: B. Mason, W. Hartkopf, W. Bagnuolo, H. McAlister, E. Nelan, & D. Wallace)

GSU Research Program Enhancement Program
Research in the Center for High Angular Resolution Astronomy
7/1/00 - 6/30/01 $42,600
(P.I.: H. A. McAlister; Co-I.: D. R. Gies, W. G. Bagnuolo)

National Aeronautics and Space Administration
Space Telescope Science Institute
Hubble Space Telescope Cycle 10 Guest Observer Program
The Masses of the O-type Binary 15 Monocerotis
1/1/01 - 12/31/04 $36,187
(P.I.: D. R. Gies; Co-I.: B. Mason, W. Hartkopf, W. Bagnuolo, H. McAlister, E. Nelan, & D. Wallace)

National Aeronautics and Space Administration
Space Telescope Science Institute
Hubble Space Telescope Cycle 9 Guest Observer Program
A High Angular Resolution Survey of the Most Massive Stars in the SMC
3/1/01 - 2/28/03 $1,430
(P.I.: E. Nelan; Co-I.: D. R. Gies & D. Wallace)

National Aeronautics and Space Administration
Georgia Space Grant Fellowship Program
Wolf-Rayet Binary Star Populations and Interactions
8/23/01 - 2/28/02 $7,200
(P.I.: D. R. Gies; Co-I.: D. Wallace)

GSU Research Program Enhancement Program
Research in the Center for High Angular Resolution Astronomy
7/1/01 - 6/30/02 $42,600
(P.I.: H. A. McAlister; Co-I.: D. R. Gies, W. G. Bagnuolo, T. Henry)

GSU Research Program Enhancement Program
Research in the Center for High Angular Resolution Astronomy
7/1/02 - 6/30/03 $42,000
(P.I.: H. A. McAlister; Co-I.: D. R. Gies, W. G. Bagnuolo, T. Henry)

National Aeronautics and Space Administration
Georgia Space Grant Fellowship Program
Wolf-Rayet Binary Star Populations and Interactions
3/01/02 - 2/28/03 $7,200
(P.I.: D. R. Gies; Co-I.: D. Wallace)

National Science Foundation Grant Number AST-0205297
Spectroscopic Investigations of Massive Binaries
8/1/02 - 7/31/05 $257,389

National Aeronautics and Space Administration
Georgia Space Grant Fellowship Program
Wolf-Rayet Binary Star Populations and Interactions
3/01/03 - 2/28/04 $7,200
(P.I.: D. R. Gies; Co-I.: D. Wallace)

National Aeronautics and Space Administration
Space Telescope Science Institute
Hubble Space Telescope Cycle 11 Guest Observer Program
The Masses of the O-type Binary 15 Monocerotis
1/1/03 - 12/31/05 $31,504
(P.I.: D. R. Gies; Co-I.: B. Mason, W. Hartkopf, W. Bagnuolo, H. McAlister, E. Nelan, & D. Wallace)

National Aeronautics and Space Administration
Space Telescope Science Institute
Hubble Space Telescope Cycle 11 Guest Observer Program
UV Spectrum of the Massive X-ray Binary LS 5039
1/1/03 - 12/31/04 $41,439
(P.I.: D. R. Gies; Co-I.: L. Kaper, V. McSwain, P. Wiita, D. Wingert)

GSU Research Program Enhancement Program
Research in the Center for High Angular Resolution Astronomy
7/1/03 - 6/30/04 $42,000
(P.I.: H. A. McAlister; Co-I.: D. R. Gies, W. G. Bagnuolo, T. Henry)

National Aeronautics and Space Administration
Georgia Space Grant Fellowship Program
Wolf-Rayet Binary Star Populations and Interactions
3/01/03 - 2/28/04 $7,200
(P.I.: D. R. Gies)

National Aeronautics and Space Administration
Space Telescope Science Institute

Hubble Space Telescope Cycles 12 -14 Guest Observer Program
The Masses of the O-type Binary 15 Monocerotis
10/1/03 - 9/30/07 $98,397
(P.I.: D. R. Gies; Co-I.: B. Mason, W. Hartkopf, W. Bagnuolo, H. McAlister, E. Nelan, & D. Wallace)

National Aeronautics and Space Administration
Space Telescope Science Institute
Hubble Space Telescope Cycle 12 Guest Observer Program
Wind Accretion and State Transitions in the Black Hole Binary Cyg X-1
10/01/03 - 01/31/06 $48,517
(P.I.: D. R. Gies; Co-I.: C. T. Bolton, R. Fender, A. Herrero, L. Kaper, L., M. V. McSwain, J. Thomson, D. J. Wallace, & P. J. Wiita)

National Aeronautics and Space Administration
Georgia Space Grant Fellowship Program
Fellowship for Angela Osterman
3/01/04 - 2/28/05 $7,200
(P.I.: D. R. Gies)

GSU Research Program Enhancement Program
Research in the Center for High Angular Resolution Astronomy
7/1/04 - 6/30/05 $42,000
(P.I.: H. A. McAlister; Co-I.: D. R. Gies, W. G. Bagnuolo, T. Henry)

Georgia PRISM Institute Mini-grant Program
Innovative Astronomy Teaching Using Lecture Activities
12/6/04 - 6/30/05 $8,800
(P.I.: D. R. Gies; Co-I.: E. Grundstrom, E. Baines)

GSU Research Program Enhancement Program
Research in the Center for High Angular Resolution Astronomy
7/1/05 - 6/30/06 $42,000
(P.I.: H. A. McAlister; Co-I.: D. R. Gies, W. G. Bagnuolo, T. Henry)

National Science Foundation Grant Number AST-0506573
Collaborative Research Using High Mass Binaries to Resolve the Mass Discrepancy: Taking Things to the Extreme
08/15/05 - 07/31/08 $54,935
(P.I.: P. L. Massey [Lowell Obs.]; Co-I.: K. Eastwood [Northern Arizona Univ.], D. Gies, L. R. Penny [College of Charleston])

National Aeronautics and Space Administration
Space Telescope Science Institute
Hubble Space Telescope Cycle 14 Guest Observer Program
Binary Stars in Cyg OB2: Relics of Massive Star Formation in a Super-Star Cluster
12/01/05 - 11/30/07 $44,153
(P.I.: D. R. Gies)

National Science Foundation Grant Number AST-0606861
Rotational Evolution of Massive Stars
08/01/06 - 07/31/10 $280,308
(P.I.: D. R. Gies)

National Science Foundation Grant Number AST-0606958
Fundamental Stellar Parameters from the CHARA Array
08/01/06 - 07/31/10 $824,034
(P.I.: H. A. McAlister.; Co-I.: D. Gies, T. ten Brummelaar, S. Ridgway [NOAO], W. Bagnuolo)

National Aeronautics and Space Administration
Space Telescope Science Institute
Hubble Space Telescope Cycle 16 Guest Observer Program
Filling the Period Gap for Massive Binaries
09/01/07 - 12/31/08 $89,705
(P.I.: D. R. Gies)

National Aeronautics and Space Administration
Georgia Space Grant Fellowship Program
Travel and Fellowship for Graduate Students
5/15/05 - 5/14/10 $64,200
(P.I.: D. R. Gies)

National Aeronautics and Space Administration
Jet Propulsion Laboratory
Stellar Astrophysics with SIM and Optical Long Baseline Interferometry
08/11/08 - 09/27/09 $32,700
(P.I.: S. Ridgway, Co-I.: D. R. Gies)

National Aeronautics and Space Administration
NASA Astrophysics Data Program
FUSE Survey of Rotation of Massive Stars
3/31/08 - 8/14/09 $15,575
(P.I.: L. R. Penny, College of Charleston, Co-I: D. R. Gies)

National Aeronautics and Space Administration
Space Telescope Science Institute
Hubble Space Telescope Director's Discretionary Program
Binaries at the Extremes of the H-R Diagram
05/01/09 - 04/30/11 $167,450

American Astronomical Society
Astrophysical Journal Scientific Editor
10/01/09 - 07/31/16 $74,060

National Aeronautics and Space Administration
Kepler GO-I (NNX10AC39G)
A Search for Companions to Intermediate Mass Binary Stars
01/22/10 - 12/31/12 $48,763

National Science Foundation Grant Number AST-1009080
Angular Momentum Destinies of Massive Stars
10/01/10 - 09/30/14 $367,392

National Aeronautics and Space Administration
Kepler GO-II
An Extended Search for Companions to Intermediate Mass Binary Stars
01/15/11 - 01/14/13 $67,143

National Aeronautics and Space Administration
Georgia Institute of Technology, Georgia Space Grant Consortium
Travel and Fellowship for Graduate Students
08/13/10 - 08/21/12 $28,000

National Aeronautics and Space Administration
Space Telescope Science Institute
Hubble Space Telescope Cycle 18 Guest Observer Program GO-12288
Hot Evolved Companions to Intermediate-Mass Main-Sequence Stars: Solving the Mystery of KOI-81
07/01/11 - 05/31/16 $69,364

National Aeronautics and Space Administration
Georgia Institute of Technology, Georgia Space Grant Consortium
Travel and Fellowship for Graduate Students
08/13/12 - 08/12/15 $35,500

National Aeronautics and Space Administration
NASA Astrophysics Data Program
A Search for Hot Subdwarf Companions to Bright Be Stars
01/01/10 - 12/31/12 $12,000
(P.I.: G. J. Peters, Univ. Southern California; Co-I: D. R. Gies)

National Aeronautics and Space Administration
Kepler GO-III
A Legacy Survey for Circumbinary Companions of Intermediate Mass Binary Stars
01/01/12 - 12/31/13 $60,510

National Aeronautics and Space Administration
Space Telescope Science Institute
Hubble Space Telescope Cycle 20 Guest Observer Program GO-12589
The Current Ultraviolet Spectrum of S Doradus: As Hot as it Gets
05/01/12 - 04/30/16 $33,676

National Aeronautics and Space Administration
Kepler GO-IV (NNX13AC20G)
Eclipsing Mapping of Pulsating Stars
01/01/13 - 06/30/15 $48,385

National Aeronautics and Space Administration
Kepler GO-IV (NNX13AD24G)
The Role of a Third Star in the Formation of Close Binaries
01/01/13 - 06/30/15 $67,927

National Aeronautics and Space Administration
Space Telescope Science Institute
Hubble Space Telescope Cycle 21 Guest Observer Program GO-13450
Separating the Spectral Components of the Massive Triple Star System Delta Orionis
01/01/15 - 12/31/17 $16,689

National Science Foundation Grant Number AST-1411654
Investigations of Binary Star Properties and Evolutionary Processes with the CHARA Array Interferometer
08/01/14 - 07/31/17 $402,342

National Aeronautics and Space Administration
Space Telescope Science Institute
Hubble Space Telescope Cycle 21 Guest Observer Program GO-13447
The massive monsters living deep in the Tarantula nebula: How massive are they really?
02/01/15 - 01/31/18 $25,760

National Aeronautics and Space Administration
Space Telescope Science Institute
Hubble Space Telescope Cycle 23 Guest Observer Program GO-14246
The Fastest Rotating Stars
06/01/16 - 05/31/19 $45,084

National Aeronautics and Space Administration
Georgia Institute of Technology, Georgia Space Grant Consortium
Travel and Fellowship for Graduate Students
07/06/15 - 07/05/18 $21,000

National Aeronautics and Space Administration
Space Telescope Science Institute
Hubble Space Telescope Cycle 24 Guest Observer Program GO-14778
Hiding in Plain Sight: The Low Mass Helium Star Companion of EL CVn
01/01/17 - 12/31/19 $46,617

National Science Foundation Grant Number AST-1211929
Fundamental Stellar Parameters and Astrophysics from the CHARA Array
08/01/12 - 07/31/17 $1,512,116
(P.I.: H. McAlister; Co-I: D. Gies, T. ten Brummelaar)

National Science Foundation
Fundamental Stellar Parameters and Astrophysics from the CHARA Array
08/01/17 - 07/31/22 $2,090,895 (pending)
(P.I.: D. Gies; Co-I: T. ten Brummelaar, H. McAlister, S. Ridgway)

National Science Foundation
Enabling Milliarcsecond Astrophysics: Open access for the CHARA Array
09/01/16 - 08/31/21 $3,902,331
(P.I.: T. ten Brummelaar; Co-I: D. Gies, S. Ridgway)

Kyoto Sangyo University
Joint Research Program between Georgia State University and Kyoto Sangyo University on the study of Active Galactic Nuclei
10/01/16 - 03/31/19 $14,000
(PI: T. ten Brummelaar; Co-I: D. Gies)

THESES SUPERVISED

Michael S. Wiggs: F89 - S91; M.S. "A Spectroscopic Search for Colliding Stellar Winds in O-type Close Binary Stars"

Rafael Wiemker: F91 - S92; M.S. "Tomographic Reconstruction of Faint Secondary Spectra in O-type Binary Systems"

Ning Liu: S95 - W96; M.S. "The Triple Star System 55 UMa" (non-thesis)

Michael E. Hahula: W90 - ; Ph.D. "Nonradial Pulsation in Be Stars" (not completed)

Laura R. Penny: F92 - S96; Ph.D. "Tomographic Separation of Spectra of O-type Binary Systems"

Anthony B. Kaye: F95 - S96; M.S. "On the Line Profile Variations and Non-Radial Pulsation Modes of ζ Tauri = HD 37202"

Michelle L. Thaller: F92 - W98; Ph.D. "Colliding Winds in Massive Binary Systems"

Kenneth M. Guyton: F94 - ; Ph.D. "Line Profiles of Rapidly Rotating Stars" (not completed)

Jon W. Sowers: F94 - W98; M.S. "Tomographic Analysis of Hα Profiles in HDE 226868/Cygnus X-1" (non-thesis)

Zhongxiang Wang, F97 - S99; M.S. "IUE Spectroscopy of the Be X-ray Binary HDE 245770" (non-thesis)

James (Rusty) Harvin, F00 - F02; Ph.D. "Doppler Tomography of the Massive Compact Binary Stars in the Multiple Star Systems δ Orionis and HD 206267"

Debra Wallace, F99 - S03; Ph.D. "An HST WFPC2 Survey for Nearby Companions of Galactic Wolf-Rayet Stars"

Wenjin Huang, F99 - S05; Ph.D. "Spectral Line Synthesis for Hot Stars"

Mary Virginia McSwain, F99 - F01; M.S. "The Orbit of the Massive X-ray Binary LS 5039"

Mary Virginia McSwain, F01 - S04; Ph.D. "The Evolutions of Massive Stars: The Be Star and Microquasar Phenomena"

Tabetha S. Boyajian, F04 - S06; M.S. "The Massive Runaway Stars HD 14633 and HD 15137" (non-thesis)

Erika D. Grundstrom, F03 - F06; M.S. "The Massive Binary RY Scuti" (non-thesis)

Erika D. Grundstrom, F04 - Sm07; Ph.D. "Hot Stars with Disks"

Stephen J. Williams, S05 - S07; M.S. "Masses of LH54-425" (non-thesis)

Stephen J. Williams, F07 - Sm11; Ph.D. "Optical Spectroscopy of Massive Binary Stars"

Saida Caballero-Nieves, F06 - F07; M.S. "Ultraviolet Spectra of Cygnus X-1" (non-thesis)

Saida Caballero-Nieves, S08 - F12; Ph.D. "A Study of Multiple Stars in Cygnus"

Noel Richardson, F06 - F08; M.S. "Spectral Energy Distributions of Be Stars" (non-thesis)

Noel Richardson, S09 - S12; Ph.D. "Spectroscopy and Interferometry of the Winds of Luminous Blue Variables"

Yamina Touhami, F06 - Sm08; M.S. "Interferometric Resolution of Be Star Disks" (non-thesis)

Yamina Touhami, F08 - S12; Ph.D. "Circumstellar Disks Around Rapidly Rotating Be-type Stars"

Benjamin Jenkins, F10 - Sm11; M.S. "A Study of the LHIRES III Spectrograph on the Hard Labor Creek Observatory 20 inch Telescope"

Rachel A. Matson, F10 - F16; Ph.D. "Fundamental Parameters of Eclipsing Binaries in the *Kepler* Field of View"

Zhao Guo, F11 - F16 ; Ph.D. "Asteroseismology in Binary Stars with Applications of Bayesian Inference Tools"

Kathryn D. Gordon, S12 - ; Ph.D. "Fundamental Properties of O- and B-type Stars"

Ryan Norris, F13 - F15 ; M.S. "Spectroscopic Studies of Multiple Stars" (non-thesis)

Luqian Wang, S14 - ; Ph.D. "Be Stars with Hot Companions"

Kathryn Lester, F14 - ; Ph.D. "Astrophysical Parameters for A- and F-type Stars in Spectroscopic Binaries"

POSTDOCTORAL FELLOWS SUPERVISED

David H. Berger, F03 - S05

Todd C. Hillwig, F03 - S04

Wenjin Huang, F05 - S06

Ellyn K. Baines, F07 - F08

Gail H. Schaefer, F07 - F11

Stephen J. Williams, F11 - F12

Yamina N. Touhami, F12 - S14

TEACHING EXPERIENCE

Astronomy 101/1010: descriptive solar system astronomy: F88, S89, F89, W90, S90, S91, F91, W93, F94, F97, W98, S99, S00, S02, F02, F07, F08, S14, S16

Astronomy 102/1020: descriptive stellar and extragalactic astronomy: W89, W91, W92, S92, F92, W94, F95, S96, F04, S06, F09, F12, S15

Astronomy 401/4010: astronomical methods laboratory: F89, W92, F93, W94, F95, F97, F98, S02, S04, S06

Astronomy 410: astronomical instruments and techniques: S95

Astronomy 499: undergraduate directed study in astronomy: Summer 93, F93

Astronomy 610: astronomical instruments and techniques: S95

Astronomy 6300/6310: Teaching Astronomy/Practicum: F05, S06, F06, S07, F07, S08, F08, S09, F09, S10, F10, F11

Astronomy 705: astronomy for teachers: W89

Astronomy 800/8000: Stellar atmospheres: W95, F96, S99, S01, S03, S05, S07, S09, S13, F14, S17

Astronomy 820/8200: Galactic structure: F93, W96, S98, F00, S04, F06, S11, F13

Astronomy 860/8600: stellar spectroscopy: F90, S93, S95, W97, F99, F01, F03, F05, S08, F11

Astronomy 8710: Research topics in astronomy: S05, Sm05, F05, S06, Sm06, F06, S07, Sm07, F07, S08, Sm08, F08, S09, Sm09, F09, S10, Sm10, F10, S11, Sm11, F11, S12, Sm12, F12, S13, Sm13, F13, S14, Sm14, F14, S15, Sm15, F15, S16, Sm16, F16, S17

Astronomy 890/8900: seminar in astronomy: S91, F92, W95, F95, F97, S00, S09

Astronomy 891/8910: directed study in astronomy: F89, W90, W92, W95, S95, Sm95, F95, W96, S96, Sm96, F96, W97, F97, S98, Sm98, F98, S99, Sm99, F99, S00, Sm00, F00, S01, F02, Sm03, F03, S04, Sm04, F04, S05, Sm05, F05, S06, Sm06, F06, S07, Sm07, F07, S08, Sm08, F08, S09, Sm09, F09, S10, Sm10, F10, S11, Sm11, F11, S12, Sm12, F12, S13, Sm13, F13, S14, Sm14, F14, S15, Sm15, F15, S16, Sm16, F16, S17

Scientific Perspectives on Global Problems PERS 2002 (Life on Other Worlds): F98, F99, F00, F01, F02, Sm05

Physics 495/4999: senior research: W90, S90, S92, F92, W93, S93, S95, Summer 98, F98, S99, F99, F09, Sm11, F11

Physics 895: directed study in physics and astronomy: W94

UNIVERSITY AND COLLEGE COMMITTEES

Secretary/Treasurer of the University Center Interdepartmental Group in Physics and Astronomy 1993-94

Vice-Chair of the University Center Interdepartmental Group in Physics and Astronomy 1994-95

Chair of the University Center Interdepartmental Group in Physics and Astronomy 1995-96

University Senator 1993-94

Senate Research Committee 1993-94

Senate Research Subcommittee on Research Center Review 1993-94

Joint subcommittee to Evaluate a Proposal to Create a Center for Biotechnology and Drug Design 1993-94

Research Office Dissertation Grant Review 1993

Senate Planning and Development Committee 1993-94

Natural Science Center Build-out Project Committee 1993-94

Strategic Planning Subcommittee 1993-94

Faculty Advisor Wells Computer Center Electronic Mail Committee 1993-94

HOK Advisory Committee on Long Range Space Needs at GSU 1995

College By-Laws Committee 1997-99

Area B Scientific Perspectives on Global Problems Committee 1997-2000

Research Office Grant Initiation Fund Review 1998

College Executive Committee 2000-02

Chair, Area B Perspectives Committee 2000-03

GSU Representative to the NASA Georgia Space Grant Consortium 2002-present

COAS Strategic Planning Working Group (Research) 2017-

DEPARTMENTAL COMMITTEES

Executive Committee 1992-2011,2012-2016

Faculty Search Committee 1992-93, 1995, 2000, 2001, 2007, 2008, 2011, 2012, 2013, 2014, 2015

Research Committee 1992-96

Hard Labor Creek Observatory Council 1992-present

Astronomy Graduate Committee 1992-present

Committee on Improvement of Instruction 1992-93

Promotion and Tenure Committee 1995, 1999-present

Academic Program Review Committee 1999, 2007, 2010

Academic Professional Review Committee 2015

Curriculum Committee 2008-2013

Chair, Triennial Review of the Chair Committee 2015

Chair, Promotion and Tenure Review Committee 2015

Chair, Academic Program Review Committee 2017

Chair, 3 Year Pre-tenure Review Commitee 2016

PROFESSIONAL SERVICE

Scientific Editor, Astrophysical Journal 2009-2016

CURRICULUM VITAE

Name: Gary Hastings
Rank: Professor
Department: Physics and Astronomy
College of Arts and Sciences
Georgia State University

a) Education

1) Ph.D. Photochemistry. 10/89-9/92
Imperial College, London.
Research: Construction of a femtosecond laser system for the study of photosystem two photosynthetic reaction centers.
Thesis Title: Radical Pair Formation in Photosystem Two.
Advisor: Professor Lord George Porter (Nobel Laureate).

2) M.Sc. Applied Optics. 10/88-9/89
Imperial College, London.
Research: Bi-directional scattering characteristics of leaves.
Thesis Title: Bi-directional Scattering Characteristics of Leaves.
Advisor: Professor Christopher Dainty.

3) B.Sc. (honors) Physics (2:1). 10/83-6/87
Edinburgh University.
Major in Applied Optics and Laser Physics.

b) Professional Credentials

1) Professor 6/15
Georgia State University.

2) Associate Professor 7/04-4/15
Georgia State University.

3) Assistant Professor (Tenure Track) 9/97-7/04
Georgia State University.

4) Postdoctoral Research Associate 2/95-8/97
Los Alamos National Laboratory.
Mentor: Dr. R. Brian Dyer.
Research: Construction of a Raman microscopic line imaging spectrometer and its use for the study of various problems in Biology, Physics and Chemistry.
Time-resolved step-scan FTIR spectroscopy applied to photosynthetic systems.

5) Postdoctoral Research Associate 10/92-1/95
Arizona State University, Department of Chemistry and Biochemistry and Center for the Study of Early Events in Photosynthesis.
Mentor: Prof. Robert Blankenship.
Research: Femtosecond laser spectroscopy of photosystem I.

c) Scholarship and Professional Development

c.1) Currently Active Research Funding

c.2) Pending

1) Department of Energy.
Solar Energy Conversion in Photosystem I Studied Using Time-resolved Visible and Infrared Difference Spectroscopy.
Submitted 12/14/16. Award # *Pending*.

Period: 7/1/17-6/30/20.
PI: G. Hastings. **$594,164**

c.3) Past Research Funding

10) Qatar National Research Fund
Solar energy conversion processes in plants and bacteria studied using nanosecond time-resolved visible and infrared spectroscopy.
PI: G. Hastings. Period: 6/12 - 3/16. **$1,010,798**

9) Department of the Army (U.S. Army Medical Research Acquisition Activity).
Contract grant number: W81XWH-06-1-0795. Period: 2/06-2/10
Rapid Identification of Biological Agents Using FTIR Microspectrometry.
Co-PI: G. Hastings (PI: Julia Hilliard). **$2,985,000**
Amount: $995,000 per year. (Hastings' share ~ $150,000 per year)

8) United States Department of Agriculture.
Grant 2004-35318-14889. Period: 9/04-9/09. Renewal.
The Molecular Details Underlying Phylloquinone Function in Photosystem I.
PI: G. Hastings. **$218,006**

7) National Natural Science Foundation of China, Grant No.10764006. **$23,684**
Theoretical Calculations of Infrared Spectra for Large Biomolecules in Photosynthetic Reaction Centers, Together With The Analysis and Study of Structure and Function of The Molecules.
Amount: 180,000.00 Chinese dollar = ~US$23,684.
PI: Dr. Ruili Wang. (G. Hastings: consultant).

6) Georgia Research Alliance (Instrument Fund).
Rapid Identification of Biological Agents with FTIR Microspectrometry
Period: 2/06
Co-PI: G. Hastings (PI: Julia Hilliard). **$237,460**

5) National Science Foundation.
Development of Far-infrared Difference Spectroscopy for Studies of Biological Pigment-Protein Complexes.
Award # DBI-0352324. Period: 7/04-6/07.
PI: G. Hastings. **$231,438**

4) United States Department of Agriculture.
The Molecular Details Underlying Phylloquinone Function in Photosystem I.
Grant 2001-35318-10894. Period: 9/01-9/04.
PI: G. Hastings. **$152,525**

3) Georgia State University
Quality Improvement Grant (12/12/97-6/30/98) **$25,200**
Nanosecond Time Resolved Visible and Infra-red Difference Spectroscopy of Photosynthetic systems. **PI**: G. Hastings.

2) Research Initiation Grant (7/1/98-6/30/99) **$4,100**
Time Resolved Infrared Spectroscopy Using a Variable Wavelength Laser Source. **PI**: G. Hastings.

1) Research Team Grant (7/1/99-6/30/00) **$7,500**
Molecular Mechanisms Underlying Photoinduced Electron Transfer in Covalently Modified DNA Complexes. **PI**: G. Hastings.

c.3) Publications

Journal Articles Submitted

1) Hiroki Makita and **Gary Hastings** (2016)

Inverted Region Electron Transfer Enhances Photosynthetic Solar Energy Conversion Efficiency. *SCIENCE*, under review.
Submitted: 11-2-16.

c.3.1) Published Journal Articles

45) Hiroki Makita and **Gary Hastings** (2016)
Time-resolved visible and infrared absorption spectroscopy data obtained using photosystem I particles with non-native quinones incorporated into the A_1 binding site.
Data in brief, 7, 1463-1468. DOI: dx.doi.org/10.1016/j.dib.2016.04.031

44) Hiroki Makita and **Gary Hastings** (2016)
Modeling Electron Transfer in Photosystem I.
Biochim. Biophs. Acta-Bioenergetics, 1857, 723-733.
DOI: dx.doi.org/10.1016/j.bbabio.2016.03.015

43) Hiroki Makita and **Gary Hastings** (2015)
Directionality of Electron Transfer In Cyanobacterial Photosystem I at 298 and 77 K.
FEBS Letters, 589, 13, 1412-1417.

42) Hiroki Makita, Nan Zhao and **Gary Hastings** (2015).
Time-resolved visible and infrared difference spectroscopy for the study of photosystem I with different quinones incorporated into the A_1 binding site.
Biochim. Biophys. Acta. 1847, 3, 343-354.

41) **Gary Hastings** (2015)
Vibrational spectroscopies on photosystem I.
Biochim. Biophys. Acta. 1847, 1, 55-68.

40) Nan Zhao and **Gary Hastings** (2013)
On the Nature of the Hydrogen Bonds to Neutral Ubiquinone in the Q_A Binding Site in Purple Bacterial Photosynthetic Reaction Centers
J. Phys. Chem. B, **117** (29) 8705-8713.

39) Nan Zhao, Hari P Lamichanne, **Gary Hastings** (2013)
Comparison of calculated and experimental isotope edited FTIR difference spectra for purple bacterial photosynthetic reaction centers with different quinones incorporated into the Q_A binding site. *Front Plant Sci.* **4**, Article 328. doi: 10.3389/fpls.2013.00328.

38) Hari Lamichhane and **Gary Hastings** (2013)
Calculated Vibrational Properties of Ubisemiquinones.
Computational Biology Journal. Vol. 2013, Article ID 807592, doi: 10.1155/2013/807592

37) Sam Mula, Michael D. McConnell, Amy Ching, Nan Zhao, Heather L. Gordon, **Gary Hastings**, Kevin E. Redding, and Art van der Est (2012)
Introduction of a Hydrogen Bond between Phylloquinone PhQA and a Threonine Side-Chain OH Group in Photosystem I.
*J. Phys. Chem. B, **116** (48), 14008–14016*

36) **Gary Hastings** and Hari Lamichhane (2011)
Calculated Vibrational Properties of Pigments in Protein Binding Sites.
Proc. Nat. Acad. Sci. USA. **108**, 10526-10531.

35) Hari Lamichhane, Ruili Wang and **Gary Hastings** (2011)
Comparison of calculated and experimental FTIR spectra of specifically labeled ubiquinones.
Vibrational Spectroscopy, **55**, 279-286.

34) **Gary Hastings**, Peter Krug, Ruili Wang, Jing Guo, Hari Lamichhane, Tian Tang, Yu-sheng Hsu, John Ward, David Katz and Julia Hilliard (2009)
Viral Infection of Cells in Culture Detected Using Infrared Microscopy.
The Analyst, **134**, 1462–1471.

33) Sreeja Parameswaran, Ruili Wang, and **Gary Hastings** (2008)
Calculation of the Vibrational Properties of Chlorophyll-*a* in solution.

J. Phys. Chem. B. **112**, 14056–14062

32) **Gary Hastings**, Ruili Wang, Peter Krug, David Katz and Julia Hilliard (2008)
Infrared Microscopy For The Study of Biological Cell Monolayers. I: Spectral Effects of Acetone and Formalin Fixation.
Biopolymers **89**, 11, 921-930.

31) **Gary Hastings** and Ruili Wang (2008)
Vibrational Mode Frequency Calculations of Chlorophyll-*d* for Assessing ($P740^+$-P740) FTIR Difference Spectra Obtained Using Photosystem I Particles from *Acaryochloris marina*.
Photosynthesis Research **95**, 55-62.

30) **Gary Hastings**, K. M. P. Bandaranayake and Enrique Carrion (2008)
Time-resolved FTIR Difference Spectroscopy in Combination With Specific Isotope Labeling For The Study of A_1, The Secondary Electron Acceptor in Photosystem 1.
Biophysical Journal **94**, 11, 4383-4392.

29) Ruili Wang, Sreeja Parameswaran and **Gary Hastings** (2007)
Density Functional Theory Based Calculations of the Vibrational Properties of Chlorophyll-*a*.
Vibrational Spectroscopy, **44**, 357–368.

28) K. M. P. Bandaranayake, Ruili Wang T. Wade Johnson and **Gary Hastings** (2006)
Time-resolved FTIR Difference Spectroscopy for the Study of Photosystem I Particles with Plastoquinone-9 Occupying the A1 Binding Site.
Biochemistry **45**, 12733-12740.

27) K. M. P. Bandaranayake, Velautham Sivakumar, Ruili Wang and **Gary Hastings** (2006)
Modeling The A_1 Binding Site In Photosystem I. Density Functional Theory For The Calculation Of "Anion – Neutral" FTIR Difference Spectra of Phylloquinone.
Vibrational Spectroscopy **42**, 78-87.

26) K. M. P. Bandaranayake, Ruili Wang and **Gary Hastings** (2006)
Modification of the Phylloquinone in the A1 Binding Site in Photosystem I Studied Using Time resolved FTIR Difference Spectroscopy and Density Functional Theory.
Biochemistry **45**, 4121-4127.

25) G. Ariyawansa, M. B. M. Rinzan, S. G. Matsik, A. G. U. Perera, **Gary Hastings**, H. C. Liu, M. Buchanan, G. I. Sproule, V. I. Gavrilenko, and V. P. Kuznetsov (2006)
Characteristics of a Si dual-band detector responding in both near- and far-infrared regions
Applied Physics Letters **89**, 061112.

24) Velautham Sivakumar, Ruili Wang and **Gary Hastings** (2005)
A_1 Reduction In Intact Cyanobacterial Photosystem I Studied Using Time-resolved Step-scan Fourier Transform Infra-red Difference Spectroscopy In Combination With Isotope Labeling.
Biochemistry **44**, 1880-1893.

23) G. Ariyawansa, M. B. M. Rinzan, D. G. Esaev, **Gary Hastings**, S. G. Matsik, A. G. U. Perera, H. C. Liu, B. N. Zvonkov and V. I. Gavrilenko (2005)
Near- and Far-Infrared p-GaAs Dual Band Detector.
Applied Physics Letters **86**, 143510, 1-3.

22) Ruili Wang, Velautham Sivakumar, T. Wade Johnson and **Gary Hastings** (2004)
FTIR difference spectroscopy in combination with isotope labeling for identification of the carbonyl modes of P700 and $P700^+$ in photosystem I.
Biophysical Journal **86**, 1061-1073.

21) Perera, V. P. S., Jayaweera, P., Pitigala, P. K. D. D. P., Bandaranayake, R. M., **Hastings**, **G.**, Perera, A. G. U. and Tennakone, K. (2004)
Construction of a photovoltaic device by deposition of thin films of the conducting polymer polythiocyanogen.
Synthetic Metals. **143**, 283-287.

20) Li, Y., Lucas, M. G., Konovalova, T., Abbott, B., MacMillan, F., Petrenko, A., Sivakumar, V., Wang, R., **Hastings**, **G.**, Gu, F., Van Tol, J., Brunel, L. C., Timkovich, R., Rappaport, F. and Redding, K. (2004)
Mutation of the Putative Hydrogen-Bond Donor to P(700) of Photosystem I.
Biochemistry **43**, 12634-12647.

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c.3.2) Book Chapters

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c.4) Professional Presentations

c.4.1) Invited Oral Presentation at International Conference

3) **Gary Hastings** (2009)
5th International Conference on. Advanced Vibrational Spectroscopy. July 2009. Melbourne, Australia. Viral Infection of Cells in Culture Detected Using Infrared Microscopy**.**

2) **Gary Hastings** (2005)
3rd. International Conference on Advanced Vibrational Spectroscopy. Delavan, WI.
Solar Conversion In Plants and Bacteria Studied Using Time-resolved Step-scan Fourier Transform Infra-red Difference Spectroscopy"

1) **Gary Hastings** (2004)
13th International Conference Of Photosynthesis. Montreal, Canada.
A_1 Reduction in Intact Cyanobacterial Photosystem I Studied Using Time-resolved Step-scan Fourier Transform Infra-red Difference Spectroscopy In Combination With Isotope Labeling and Quinone Exchange Experiments.

c.4.2) Oral Presentations (presenter underlined)

36) Hiroki Makita and **Gary Hastings** (2016)
The A_1 Binding Site in Photosystem I Studied by Time-Resolved FTIR Difference Spectroscopy.
42nd Midwest/Southeast Photosynthesis Conference.
Turkey Run State Park. Marshal IA. Nov. 4-6, 2016. Abstracts Booklet p16.

35) Hiroki Makita and **Gary Hastings** (2015)
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34) Hiroki Makita and **Gary Hastings** (2015)
Biological Electron Transfer in Photosystem I.
Physics Graduate Student Association Annual Conference. April. 24.

33) Hiroki Makita and **Gary Hastings** (2015)
$P700^+A_1^-$ Charge Recombination in Photosystem I Occurs in the Marcus Inverted Region.
32nd Annual Eastern Regional Photosynthesis Conference. Woods Hole. MA. April. 17-19.
Conference Program and Abstract Booklet Page 31.

32) Hiroki Makita and **Gary Hastings** (2014)

Time-Resolved Visible and Infrared Difference Spectroscopy for the Study of Photosystem I With Different Quinones Incorporated Into the A1 Binding Site.
40th Annual Midwest/Southeast Photosynthesis Meeting.
Turkey Run State Park. Marshal IA. Oct. 24-26, 2014. Abstracts Booklet p18.

31) Nan Zhao, Hiroki Makita and **Gary Hastings** (2014)
Time-resolved spectroscopic studies of photosystem I particles with different quinones occupying the A_1 binding site. 31st Eastern regional photosynthesis conference. Woods Hole. MA. April. 4-6. Conference Program and Abstract Booklet Page 12.

30) Samuel Mula, Michael McConnell, Amy Ching, Nan Zhao, Heather Gordon, **Gary Hastings**, Kevin Redding and Art van der Est. (2013)
Introduction of a Hydrogen Bond between Phylloquinone PhQA and a Threonine Side-chain OH Group in Photosystem I. 30th Eastern regional photosynthesis conference. Woods Hole. MA. April. 12-14. Abstract Booklet Page 8.

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Is Not Strongly Hydrogen Bonded. 28th Annual eastern regional conference in photosynthesis. Woods Hole. MA. April. 1-3 2011. Abstract Booklet Page 27.

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ONIOM method for the exploration of double difference spectra of ubiquinone in the Q_A binding site of Rb. Sphaeroides.
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Viral Infection of Cells in Culture Detected Using Infrared Microscopy
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23) **Gary Hastings** and Sreeja Parameswaran
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22) Nan Zhao and **Gary Hastings** (2009)
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34th Midwest/Southeast Regional Conference in Photosynthesis. Oct. 2008.
Light induced FTIR difference spectroscopy of photosynthetic reaction centers in the frequency region between 1000-250 cm^{-1}.

18) Sreeja Parameswaran and **Gary Hastings** (2008)
34th Annual Midwest/Southeast Regional Conference in Photosynthesis. Oct. 2008.
Calculation of the properties of P700.

17) **Gary Hastings,** Sreeja Parameswaran and Ruili Wang (2008)
25th Eastern Regional Photosynthesis Conference in Photosynthesis.
Calculation of the Vibrational Properties of Chlorophyll-*a* In Solution.

16) Sreeja Parameswaran and **Gary Hastings** (2007)
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Time-resolved FTIR Difference Spectroscopy Used To Study Photosystem I Particles With Different Quinones Occupying The A_1 Binding Site.

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3rd. International Conference on Advanced Vibrational Spectroscopy. Delavan, WI.
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11) **Gary Hastings** and Priyangika Bandaranayake (2005)
31st Annual Midwest/Southeast Regional Conference in Photosynthesis. Marshall, IN.
A_1 Reduction in Intact Cyanobacterial Photosystem I Studied Using Time-resolved Step-scan FTIR Difference Spectroscopy In Combination With Isotope Labeling, Site Directed Mutagenesis, Quinone Exchange and Density Functional Theory Calculations.

10) Priyangika K.M. Bandaranayake and **Gary Hastings** (2005)
22nd Annual Eastern Regional Conference in Photosynthesis, Woods Hole, MA.
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A_1 Reduction in Intact Cyanobacterial Photosystem I Studied Using Time-resolved Step-scan Fourier Transform Infra-red Difference Spectroscopy In Combination With Isotope Labeling and Quinone Exchange Experiments.

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7) **Gary Hastings** (2003)
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Energy and Electron Transfer Processes in Photosystem I.

1) **Gary Hastings**, Lin, S. Kleinherenbrink, F. A. M. and Blankenship, R. E. (1993)
XXI Annual Meeting of the American Society for Photobiology. Chicago, Ill. June 26-30, 1993.
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c.4.3) Poster Presentations

86) Hiroki Makita and **Gary Hastings** (2016)
Inverted Region Electron Transfer Enhances Photosynthetic Solar Energy Conversion Efficiency.
42nd Midwest/Southeast Photosynthesis Conference.
Turkey Run State Park. Marshal IA. Nov. 4-6, 2016.

85) Hiroki Makita and **Gary Hastings** (2016)
The A_1 Binding Site in Photosystem I Studied by Time-Resolved FTIR Difference Spectroscopy.
42nd Midwest/Southeast Photosynthesis Conference.
Turkey Run State Park. Marshal IA. Nov. 4-6, 2016. Abstracts Booklet p16.

84) Hiroki Makita, Leyla Rohani and Gary Hastings (2016)
Infrared Spectroscopy and Vibrational Frequency Calculations for the Study of Electron Transfer in Photosynthetic Protein Complexes.
GSU Scientific Computing Day Conference. Sept. 30, 2016.

83) Leyla Rohani, Hiroki Makita and Gary Hastings (2016)
Vibrational Properties of Quinones in Protein Binding Sites
GSU Scientific Computing Day Conference. Sept. 30, 2016.

82) Hiroki Makita and **Gary Hastings** (2016)
Vibrational Spectroscopy for the Study of Biological Electron Transfer.
Molecular Basis of Disease Research Day.

Atlanta GA. May 23.

81) Velautham Sivakumar, Karuppasamy Ganesh, **Gary Hastings** and Yasser Hussein (2016) Computational Calculation of Midpoint Potential of Naphthoquinones in the A_1 Binding Site of the Photosystem I.
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80) Yasser Hussein, Velautham Sivakumar, Karuppasamy Ganesh, and **Gary Hastings** (2015) Biomaterial for solar energy conversion: Time resolved visible spectroscopy study on electron transfer process in Photosystem I.

79) Hiroki Makita and **Gary Hastings** (2015)
Radical Pair Recombination in Photosystem I Occurs in the Marcus Inverted Region.
Gordon Conference in Photosynthesis. Waltham, MA. June 28-July 3.

78) Hiroki Makita and **Gary Hastings** (2015)
On the Directionality of Electron Transfer In Photosystem I.
32nd Annual Eastern Regional Photosynthesis Conference. Woods Hole, MA. April 17-19.
Conference Program and Abstract Booklet Page 53.

77) Nan Zhao and **Gary Hastings** (2015)
Phylloquinone in the A_1 binding site in photosystem I is very strongly hydrogen bonded. 32nd Annual Eastern Regional Photosynthesis Conference. Woods Hole, MA. April 17-19.
Conference Program and Abstract Booklet Poster 16.

76) Hiroki Makita and **Gary Hastings** (2015)
$P700^+A_1^-$ Charge Recombination in Photosystem I Occurs in the Marcus Inverted Region.
32nd Annual Eastern Regional Photosynthesis Conference. Woods Hole, MA. April 17-19.
Conference Program and Abstract Booklet Poster 36.

75) Hiroki Makita and **Gary Hastings** (2014)
Time-Resolved Visible and Infrared Difference Spectroscopy for the Study of Photosystem I With Different Quinones Incorporated Into the A_1 Binding Site.
40th Annual Midwest/Southeast Photosynthesis Meeting.
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74) Hiroki Makita, Velautham Sivakumar, Yasser Hussein and **Gary Hastings** (2014)
Solar Energy Conversion in Plants and Bacteria Studied Using Time Resolved Visible and Infrared Difference Spectroscopy.
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73) Hiroki Makita and **Gary Hastings** (2014)
Time-Resolved Visible and Infrared Difference Spectroscopy for the Study of Photosystem I With Different Quinones Incorporated Into the A1 Binding Site. Gordon Research Conference on Photosynthesis. Mount Snow Resort, West Dover VT. Aug. 10-15, 2014.

72) Nan Zhao and **Gary Hastings** (2014)
Vibrational properties of quinones in photosystem I reaction centers.
Molecular Basis of Disease Research Conference at GSU. June 13, 2014.

71) Hiroki Makita and **Gary Hastings** (2014)
Fourier Transform Infrared Difference Spectroscopy for the Studies of Zinc-substituted Reaction Center from *Rhodobacter sphaeroides*. 31st Eastern regional photosynthesis conference. Woods Hole. MA. April. 4-6.

70) Hiroki Makita and **Gary Hastings** (2014)
Nanosecond Time-Resolved Absorption Spectroscopy for the Study of Light Induced Electron Transfer Processes in menB Mutant Photosystem I Reaction Centers. 31st Eastern regional photosynthesis conference. Woods Hole. MA. April. 4-6.

69) Nan Zhao, Hiroki Makita and **Gary Hastings** (2014)

Time-resolved spectroscopic studies of photosystem I particles with different quinones occupying the A_1 binding site. 31st Eastern regional photosynthesis conference. Woods Hole. MA. April. 4-6. Abstract Booklet Page 12.

68) Yasser Hussein, Velautham Sivakumar, Elham Bassam and Gary Hastings (2014)
Laser Flash Photolysis Studies of Quenching the Triplet Excited State of Chloranil by dAMP in Protic and Aprotic Solvents. 5th Annual Symposium on Materials Science and Engineering, Qatar University, Center for Advanced Materials, February 18.

67) Hiroki Makita and **Gary Hastings** (2013)
Fourier Transform Infrared Difference Spectroscopy for the Studies of Zinc-substituted Reaction Center from *Rhodobacter sphaeroides*
39th Annual midwest/southeast photosynthesis meeting.
Turkey Run State Park. Marshal IA. Nov. 8-10.

66) Nan Zhao and **Gary Hastings**
On the Nature of the Hydrogen Bonds to Neutral Ubiquinone in the Q_A Binding Site in Purple Bacterial Photo-synthetic Reaction Centers.
39th Annual midwest/southeast photosynthesis meeting.
Turkey Run State Park. Marshal IA. Nov. 8-10 2013. Abstract Booklet Page 55.

65) Hiroki Makita and **Gary Hastings** (2013)
Nanosecond Time-Resolved Absorption Spectroscopy for the Study of Light Induced Electron Transfer Processes in menB Mutant Photosystem I Reaction Centers
39th Annual midwest/southeast photosynthesis meeting.
Turkey Run State Park. Marshal IA. Nov. 8-10 2013. Abstract Booklet Page 46.

64) Nan Zhao and **Gary Hastings** (2013)
ONIOM Calculated Isotope Edited FTIR Difference Spectra for Purple Bacterial Reaction Centers with Different Quinones Incorporated into the Q_A binding site.
39th Annual midwest/southeast photosynthesis meeting.
Turkey Run State Park. Marshal IA. Nov. 8-10 2013. Abstract Booklet Page 39.

63) Nan Zhao and **Gary Hastings** (2013)
On the Nature of the Hydrogen Bonds to Neutral Ubiquinone in the Q_A Binding Site in Purple Bacterial Photo-synthetic Reaction Centers.
The 16th International Congress on Photosynthesis. St. Louis, MO, USA August 11-16, 2013.
Poster Group 18 - Electron and Proton Transfer B. Poster 129.

62) Hiroki Makita and **Gary Hastings** (2013)
Nanosecond Time-Resolved Absorption Spectroscopy for the Study of Light Induced Electron Transfer Processes in menB Mutant Photosystem I Reaction Centers
The 16th International Congress on Photosynthesis. St. Louis, MO, USA August 11-16, 2013.
Poster Group 04 - Reaction Center A. Poster 122.

61) Nan Zhao and **Gary Hastings** (2013)
ONIOM Calculated Isotope Edited FTIR Difference Spectra for Purple Bacterial Reaction Centers with Different Quinones Incorporated into the QA binding site.
The 16th International Congress on Photosynthesis. St. Louis, MO, USA August 11-16, 2013.
Poster Group 04 - Reaction Center A. Poster 107.

60) Samuel Mula, Michael McConnell, Amy Ching, Nan Zhao, Heather Gordon, **Gary Hastings**, Kevin Redding and Art van der Est. (2013)
Introduction of a Hydrogen Bond between Phylloquinone PhQA and a Threonine Side-chain OH Group in Photosystem I. 30th Eastern regional photosynthesis conference. Woods Hole. MA. April. 12-14. Abstract Booklet Page 8.

59) Nan Zhao and **Gary Hastings** (2012).
ONIOM (QM:MM) Calculated Vibrational Properties of Quinones In The Q_A Binding Site in Purple Bacterial Reaction Centers. Gordon Research Conference In Photosynthesis.
Davidson, NC. July 8-13 2012.

58) Nan Zhao and **Gary Hastings** (2012)
ONIOM (QM:MM) Calculated Vibrational Properties of Quinones In The Q_A Binding Site in Purple Bacterial Reaction Centers.
Molecular Basis of Disease Conference at GSU. June 7 2012.

57) Hari Lamichhanne and **Gary Hastings** (2011).
The Q_A Ubiquinone in *Rhodobacter sphaeroides* Photosynthetic Reaction Centers Is Not Strongly Hydrogen Bonded. 28th Annual eastern regional conference in photosynthesis. Woods Hole. MA. Oct. 1-3 2011. Abstract Booklet Page 49.

56) Hari Lamichhanne and **Gary Hastings** (2011).
ONIOM Calculated Vibrational Properties of Chainless Symmetrical Quinones Occupying The Q_A Binding Site in Purple Bacterial Photosynthetic Reaction Centers. 28th eastern regional conference in photosynthesis. Woods Hole. MA. Oct. 1-3 2011. Abstract Booklet Page 45.

55) Nan Zhao and **Gary Hastings** (2010). Time-resolved FTIR Difference Spectroscopy for the Study of A_1, the Secondary Electron Acceptor in Photosystem I.
36th Annual midwest/southeast photosynthesis meeting.
Turkey Run State Park. Marshal IA. Oct. 29-31 2010. Abstract Booklet Page 32.

54) Nan Zhao and **Gary Hastings** (2010). Time-resolved FTIR difference spectroscopy for the study of A_1, the secondary electron acceptor in photosystem I. Proceedings of the 15th International Conference of Photosynthesis. Beijing, China. Abstract PS1.13, p15.

53) **Gary Hastings**, Pinhas Fuchs, Ruili Wang, Yu-sheng Hsu and Julia Hilliard. (2009)
Rapid Identification of Apoptotic T-Cells Using Infrared Microscopy
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52) Sreeja Parameswaran and **Gary Hastings** (2009)
Hydrogen Bonding to The P_B Chlorophyll of P700 Investigated Using FTIR Difference Spectroscopy and Quantum Chemical Vibrational Frequency Calculations
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5th Int. Conference on Advanced Vibrational Spectroscopy. 12-17 July. Melbourne, Australia.
Rapid Identification of Apoptotic T-Cells Using Infrared Microscopy.

50) Jing Guo, Ruili Wang, Chad Filfilli, Yu-sheng Hsu, Julia Hilliard and **Gary Hastings** (2009)
5th Int. Conference on Advanced Vibrational Spectroscopy. 12-17 July. Melbourne, Australia.
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49) Sreeja Parameswaran and **Gary Hastings** (2009)
Calculation of the vibrational properties of P700, a chlorophyll-a heterodimer.
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48) Hari Lamichhane and **Gary Hastings** (2009)
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6th annual Emerson Center Lectureship Award Symposium. 03-02-09. Emory University.

47) Ruili Wang and **Gary Hastings** (2008)
Density functional calculations for the study of the effect of axial ligation of chlorophyll-a in photosystem I reaction center. 34th Midwest/Southeast Regional Conference in Photosynthesis. Turkey Run State Park, Marshall, IN.

46) Nan Zhao and **Gary Hastings** (2008)
Time-Resolved FTIR Difference Spectroscopy in Combination with Isotope Labeling for the Study of A_1, the Secondary Electron Acceptor in Photosystem I. 34th Midwest/Southeast Regional Conference in Photosynthesis. Turkey Run State Park, Marshall, IN.

45) Sreeja Parameswaran and **Gary Hastings** (2008)
Calculation of the vibrational properties of chlorophyll molecules in photosynthetic reaction centers. 34th Midwest/Southeast Regional Conference in Photosynthesis. Turkey Run State Park, Marshall, IN.

44) **Gary Hastings** (2008)
Calculation of the Vibrational Properties of Chlorophyll-*a* In Solution.
25th Eastern Regional Photosynthesis Conference in Photosynthesis, Woods Hole, MA. April, 2008. Poster Abstract p12.

43) **Gary Hastings** and K. M. P. Bandaranayake (2007)
The Molecular Details Underlying Phylloquinone Function in Photosystem I.
USDA Awardee Meeting. "Genes to Products: Agricultural Plant, Microbe and Biobased Product Research" March 12-14, Marriott Bethesda, Md. Conference Booklet page 95-96.

42) Ruili Wang and **Gary Hastings** (2007)
Calculation of the Vibrational Properties of Chlorophyll-a. Proceedings,
24th Eastern Regional Photosynthesis Conference. Poster Abstract p55.

41) Sreeja Parameswaran and **Gary Hastings** (2007)
Calculated Electronic Spectra of Chlorophyll-a. Proceedings, 24th Eastern Regional Photosynthesis Conference. Poster Abstract p20.

40) Ruili Wang and **Gary Hastings**
Calculation of the vibrational properties of chlorophyll-a.
Photosynth. Res. 91:150-150. (Poster Abstract)
14th International Congress on Photosynthesis. Glasgow, Scotland 23-27 July, 2007

39) Sreeja Parameswaran and **Gary Hastings**.
Calculated electronic spectra of chlorophylls in solution.
Photosynth Res 91:149-150. (Poster Abstract)
14th International Congress on Photosynthesis. Glasgow, Scotland 23-27 July, 2007

38) **Gary Hastings** and K. M. P. Banderanayake.
(A_1^--A_1) FTIR difference spectra obtained using photosystem I particles with O-18 and specifically C-13 labeled quinones occupying the A_1 Binding Site.
Photosynth Res 91:149-149. (Poster Abstract)
14th International Congress on Photosynthesis. Glasgow, Scotland 23-27 July, 2007

37) **Gary Hastings** and K. M. P. Bandaranayake (2007)
Time-resolved FTIR Difference Spectroscopy in Combination With Specific Isotope Labeling For The Study of A_1, The Secondary Electron Acceptor in Photosystem 1
33rd Midwest/Southeast Photosynthesis Meeting, Turkey Run State Park, Marshall, IN. Nov. 9-11, 2007. Program Book Abstract page 28.

36) Hari Lamichhane and **Gary Hastings** (2007)
Calculation and Experimentation To Elucidate the Vibrational Properties of the Iron Sulfur Clusters in Photosystem I. 33rd Midwest/Southeast Photosynthesis Meeting, Turkey Run State Park, Marshall, IN. Nov. 9-11, 2007. Program Book Abstract page 29.

35) **Gary Hastings**, K. M. P. Bandaranayake and Ruili Wang. (2006)
USDA Awardee Meeting. "Genes to Products: Agricultural Plant, Microbe and Biobased Product Research" Feb. 27-28, 2006. Airlie Conference Center, Warrenton Virginia.
A_1 Reduction in Intact Cyanobacterial Photosystem I Studied Using Time-resolved Step-scan FTIR Difference Spectroscopy In Combination With Isotope Labeling, Site Directed Mutagenesis, Quinone Exchange and Density Functional Theory Calculations.

34) **Gary Hastings**, K. M. P. Bandaranayake and Ruili Wang.
Georgia State University, Biology Department, 12th Annual Open House / Poster Day 2006.
A_1 Reduction in Intact Cyanobacterial Photosystem I Studied Using Time-resolved Step-scan FTIR Difference Spectroscopy In Combination With Isotope Labeling, Site Directed Mutagenesis, Quinone Exchange and Density Functional Theory Calculations.

33) **Gary Hastings** and K. M. P. Bandaranayake (2006)
Gordon Conference in Photosynthesis. 7/02/06-7/07/06. Smithfield, RI.
Modification of the Quinone Occupying the A_1 Binding Site in Cyanobacterial Photosystem I Studied Using Time-resolved Step-scan FTIR Difference Spectroscopy.

32) Sreeja Parameswaran and **Gary Hastings** (2006)
23rd Annual Eastern Regional Photosynthesis Conference. Woods Hole, MA.
On the Origin of the 1656(+)/1637(-) cm^{-1} Difference Band in ($P700^+$-P700) FTIR Difference Spectra: Low Temperature FTIR Difference Spectroscopy for the Study of P700 IN Y(B718)T Mutant Cyanobacterial PS I particles.

31) K. M. P. Bandaranayake, Ruili Wang and **Gary Hastings** (2006)
23rd Annual Eastern Regional Photosynthesis Conference. Woods Hole, MA.
Time-resolved FTIR Difference Spectroscopy Used To Study Photosystem I Particles With Different Quinones Occupying The A_1 Binding Site.

30) **Gary Hastings** and K. M. P. Bandaranayake (2006)
32nd Annual Midwest Photosynthesis Conference. Turkey Run State Park, Marshall, IN.
Time-resolved FTIR Difference Spectroscopy For The Study of Photosystem I Particles With ^{18}O Labeled Phylloquinone Occupying The A_1 Binding Site.

29) Ruili Wang, Sreeja Parameswaran and **Gary Hastings** (2005)
22nd Annual Eastern Regional Conference in Photosynthesis, Woods Hole, MA.
($P700^+$-P700) FTIR Difference Spectra Obtained Using Cyanobacterial Photosystem I Particles at 77 K.

28) Velautham Sivakumar and **Gary Hastings** (2004)
21st Annual Eastern Regional Conference in Photosynthesis, Woods Hole, MA.
Hybrid Density Functional Theory For The Prediction of The Vibrational Properties of Unlabeled and Isotope Labeled Quinones

27) Ruili Wang and **Gary Hastings** (2004)
21st Annual Eastern Regional Conference in Photosynthesis, Woods Hole, MA.
Histidine Modes in ($P700^+$-P700) FTIR Difference Spectra

26) Ruili Wang and **Gary Hastings** (2004)
PS2004, 13th International Conference On Photosynthesis. Montreal, Canada.
Computed Infrared spectra of protonated and metal bound methylimidazole.

25) Yajing Li, Feifei Gu, Tanya Konovalova, Alexander Petrenko, Marie-Gabriele Lucas, Fabrice Rappaport, Velautham Sivakumar, Ruili Wang, **Gary Hastings**, Johannes van Tol, Louis-Claude Brunel, Fraser MacMillan and Kevin Redding (2003)
Gordon Conference on Photosynthesis Research (Biophysical Aspects). Bristol, RI.
P700: Effect of the Loss of Axial Ligands and the Hydrogen Bond to P_A.

24) Velautham Sivakumar, Ruili Wang and **Gary Hastings** (2003)
Gordon Conference on Photosynthesis Research (Biophysical Aspects). Bristol, RI.
Fourier Transform Infrared Difference Spectroscopy for the Study of A_1 reduction in Photosystem I from *Synechococcus* sp. 7002.

23) Ruili Wang, Velautham Sivakumar, Wade Johnson and **Gary Hastings** (2003)
Gordon Conference on Photosynthesis Research (Biophysical Aspects). Bristol, RI.
FTIR Difference Spectroscopy and Global Isotope Labeling for Identification of the Carbonyl Modes of P700 and $P700^+$ in Photosystem I.

22) Velautham Sivakumar, Ruili Wang and **Gary Hastings** (2003)
20th Annual Eastern Regional Conference in Photosynthesis, Woods Hole, MA.
Fourier Transform Infrared Difference Spectroscopy for the Study of A_1 Reduction in Photosystem I from *Synechococcus* sp. PCC 7002.

21) **Gary Hastings**, Ruili Wang, Velautham Sivakumar, V. M. Ramesh, Kevin Redding and Andrew Webber (2003)
20th Annual Eastern Regional Conference in Photosynthesis, Woods Hole, MA. April 11-13,
Direct Observation of Vibrational Modes of Amino Acids That Interact With P700.

20) Ruili Wang, Velautham Sivakumar and **Gary Hastings** (2003)
20th Annual Eastern Regional Conference in Photosynthesis, Woods Hole, MA.
Photo-Oxidation of P740, the Primary Electron Donor in Photosystem I From *Acaryochloris*

marina.

19) Ruili Wang, V. Sivakumar, V. M. Ramesh, Andrew N. Webber and **Gary Hastings** (2003)
20th Annual Eastern Regional Conference in Photosynthesis, Woods Hole, MA.
On The Axial Histidine Ligands of P700.

18) K. Redding, Y. Li, F. Rappaport, **G. Hastings**, A. van der Est, F. Gu, F. Briggins (2002)
54th Southeast Regional Meeting of the American Chemical Society. Charleston, SC.
Exploring Asymmetry Within The Photosystem I Reaction Center.

17) A. Petrenko, Y. Li, V. Sivakumar, R. Wang, Hans van Tol, F. Rappaport, **G. Hastings**, and K. Redding (2002)
Gordon Conference on Photosynthesis Research (Biochemical Aspects). Bristol, RI.
Influence of Protein Environment on Functional Properties of Electron Transfer Chain Cofactors in Photosystem I.

16) R. Wang, V. Sivakumar, V. M. Ramesh, A. N. Webber, K. Redding and **Gary Hastings** (2002)
Gordon Conference on Photosynthesis Research (Biochemical Aspects). Bristol, RI.
Direct Observation of Vibrational Modes of Amino Acids That Interact With P700.

15) **Gary Hastings** and Velautham Sivakumar (2001)
XII International Congress on Photosynthesis. 2001. Brisbane, Australia. Aug. 18-23, 2001.
Time resolved Fourier Transform Infrared Difference Spectroscopy for the Study of A_1 in Photosystem I.

14) **Gary Hastings,** Ruili Wang and Velautham Sivakumar (2001)
XII International Congress on Photosynthesis. 2001. Brisbane, Australia.
Primary Donor Photo-oxidation in Photosystem I from *Synechocystis* sp. 6803 and *Acarychloris marina*: A Fourier Transform Infrared Difference Spectroscopic Study.

13) **Hastings, G**., Ramesh, V, Sivakumar, V. Wang, R. and Webber, A. (2001
XII International Congress on Photosynthesis. 2001. Brisbane, Australia.
Primary Donor Photo-oxidation in Photosystem I: A Re-Evaluation of ($P700^+$-P700) Fourier Transform Infrared Difference Spectra.

12) **Gary Hastings** and Velautham Sivakumar (2001)
Satellite Conference to XII Congress on Photosynthesis. Electron Transfer Processes in Oxygenic Photosynthesis. South Stradbroke Island, Australia.
Time resolved Fourier Transform Infrared Difference Spectroscopy for the Study of A_1 in Photosystem I.

11) **Hastings, G.,** Ramesh, V, Sivakumar, V. Wang, R. and Webber, A. (2001)
Satellite Conference to XII Congress on Photosynthesis. Electron Transfer Processes in Oxygenic Photosynthesis. South Stradbroke Island, Australia.
Primary Donor Photo-oxidation in Photosystem I: A Re-Evaluation of ($P700^+$-P700) Fourier Transform Infrared Difference Spectra.

10) Velautham Sivakumar, Ruili Wang and **Gary Hastings** (2001)
Satellite Conference-XII Congress on Photosynthesis: South Stradbroke Island, Australia.
Electron Transfer Processes in Oxygenic Photosynthesis.
Primary Donor Photo-oxidation in Photosystem I from *Synechocystis sp. 6803* and *Acarychloris Marina*: A Fourier Transform Infrared Difference Spectroscopic Study"

9) **Gary Hastings** (2001)
Satellite Conference to XII Congress on Photosynthesis. Electron Transfer Processes in Oxygenic Photosynthesis. South Stradbroke Island, Australia.
Time-Resolved, Step-Scan, Fourier Transform Infra-red and Visible Absorption Difference Spectroscopy for the Study of Photosystem I

8) **Gary Hastings** and R. Brian Dyer (1996)
XV International Conference on Raman Spectroscopy, Pittsburgh, PA.
Raman Microscopic Line Imaging.

7) **Hastings, G**., Lin, S. Reid, L. and Blankenship, R. E. (1994) Gordon Conference on Photosynthesis (Biophysical Aspects). New Hampton, NH.
Excited state dynamics in photosystem I. Effects of detergent and excitation wavelength.

6) **Hastings, G**., Lin, S. Reid, L. and Blankenship, R. E. (1994)
XXII Annual Meeting of the American Society for Photobiology. Scottsdale, Az.
Excited state dynamics in photosystem I. Effects of detergent and excitation wavelength.

5) **Hastings, G**., Lin, S. Kleinherenbrink, F. A. M. and Blankenship, R. E. (1993)
XXI Annual Meeting of the American Society for Photobiology. Chicago, Ill. 26-30 June, 1993.
Ultrafast Spectroscopy for The Study of Electron Transfer in Chloroflexus *Aurantiacus* Reaction Centers.

4) **Hastings, G**., Lin, S. Kleinherenbrink, F. A. M. and Blankenship, R. E. (1993)
Western Regional Conference in Photosynthesis. Asilomar, CA.
Time resolved fluorescence and absorption studies of photosystem 1.

3) **Hastings, G**., Lin, S. and Blankenship, R. E. (1993)
Western Regional Conference in Photosynthesis. Asilomar, CA.
Ultrafast Spectroscopy Studies of Chloroflexus *Aurantiacus* Reaction Centers.

2) **Hastings, G.,** Durrant, J. R., Barber, J., Porter G. and Klug, D. R. (1992)
IX Congress on Photosynthesis Research. Nagoya, Japan. 30 August-4 September, 1992.
Radical Pair Formation In Photosystem II.

1) Klug, D. R., Durrant, J. R., **Hastings, G.,** Barber, J. and Porter G. (1992)
IX Congress on Photosynthesis Research. Nagoya, Japan.
Electron and energy transfer in isolated photosystem 2 reaction centers.

c.4.4) Seminars/Colloquia and Other Invited Presentations

17) Energy Sustainability Lecture Series, Nova Southeastern University. November 21, 2016.
"Mechanisms underlying highly efficient solar energy conversion in photosynthesis"
Host: Dr. Reza Razhigifard.

16) National Research Council (CNR), Biophysics Institute, Milan. July 18, 2016.
"Mechanisms underlying highly efficient solar energy conversion in photosynthesis" Host: Dr. Stefano Santabarbara.

15) University of Toronto, Department of Chemistry, July 31, 2014.
"Time Resolved Visible and Infrared Difference Spectroscopy for the Study of Photosystem I Photosynthetic Reaction Centers with Altered Pigment Composition" Host: Dr. Jacob Dean and Dan Oblinski (in lieu of Prof. Greg Scholes).

14) Edinburgh University, Department of Physics. July 28, 2014.
"Solar Energy Conversion in Plants and Bacteria Studied Using Time Resolved Visible and Infrared Difference Spectroscopy" Host: Prof. Martin Evans.

13) Purdue University, Department of Physics. Jan. 17, 2012.
"Solar Energy Conversion in Plants and Bacteria Studied Using Time Resolved FTIR Difference Spectroscopy" Host: Prof. Sergei Savikhin.

12) University of Missouri, Department of Chemistry. Oct. 15, 2010.
"Calculated Vibrational Properties of Pigments in Protein Binding Sites"
Host: Prof. Jason Cooley.

11) University of Sydney, Department of Chemistry. July 24, 2009
"Hydrogen Bonding to The P_B Chlorophyll of P700 Investigated Using FTIR Difference Spectroscopy and Quantum Chemical Vibrational Frequency Calculations"
Host: Jeff Reimers.

10) Australian National University, Research School of Chemistry. July 22. 2009.
"Hydrogen Bonding to the P_B Chlorophyll of P700 Investigated Using FTIR Difference Spectroscopy and Quantum Chemical Vibrational Frequency Calculations"
Host: Warwick Hillier.

9) Department of Physics. Kunming Normal University. Kunming, China. April, 2008.
"Infrared Microscopy for the Detection of Pathogens in Biological Cells"

8) Department of Chemistry, Brock University, St. Catherines, Ontario Canada. April 20, 2006.
Solar Energy Conversion in Plants and Bacteria Studied Using FTIR Difference Spectroscopy.
Host: Art van der Est.

7) University of Alabama at Tuscaloosa, Department of Chemistry. December 6, 2001.
"Infrared spectroscopy for the study of biological systems."

6) PMACS Seminar. Emory University, Department of Physics. November 30, 1999.
"Infrared spectroscopy as a probe of protein structure and function."

5) Georgia State University. Department of Biology. Undergraduate Seminar Series. Oct. 1, 1999.
"(Spectroscopic Studies of) Solar Energy Conversion in Plants and Bacteria."

4) Georgia State University. Department of Biology. Graduate Seminar Series. August 27, 1999.
"Infrared spectroscopy as a probe of protein structure and function."

3) Georgia State University. Joint Chemistry and Biology Seminar, 23 February 1998.
"Raman Microscopic Line Imaging."

2) Arizona State University. Center for the Study of Early Events in Photosynthesis. May 1994.
"Energy and Electron Transfer in Photosystem I"

1) Arizona State University. Center for the Study of Early Events in Photosynthesis. July 1992.
Radical Pair Formation in Photosystem II.

c.4.5) Seminars Given By Laboratory Personnel (Students/Postdocs)

20) Physics Department Seminar. Georgia State University. Dec. 4, 2014.
Ms. Venus Saatchi.
Light Induced Electron Transfer in Photosynthetic Systems.

19) Physics Department Seminar. Georgia State University. July 10, 2014.
Ms. Nan Zhao.
Vibrational Properties of Quinones in Photosynthetic Reaction Centers.

18) Physics Department Seminar. Georgia State University. July 13, 2012.
Mr. Hiroki Makita.
Time Resolved Absorption Spectroscopy for the Study of Electron Transfer Processes in Photosynthetic Systems.

17) Physics Department Seminar. Georgia State University. August 1, 2011.
Mr. Hari Lamichhane.
Calculated Vibrational Properties of Quinones in Photosynthetic Reaction Centers.

16) Physics Department Seminar. Georgia State University. April 8, 2011.
Ms. Jing Guo.
Diagnosing changes in cells using FTIR microspectroscopy.

15) Physics Department Seminar. Georgia State University. May 5, 2009.
Ms. Sreeja Parameswaran.
Solar Energy Conversion in Plants and Bacteria studied using FTIR Difference Spectroscopy and Quantum Chemical Computational Methodologies.

14) Louisiana State University, Health Sciences Center, Feb. 3, 2009.
Ms. Sreeja Parameswaran.
Solar Energy Conversion in Plants and Bacteria

13) Physics Department Seminar. Georgia State University. April 16, 2009.
Ms. Jing Guo.
FTIR microspectroscopy in studies of viral invasion cells.

12) Physics Department Seminar. Georgia State University. April 4, 2009.
Ms. Nan Zhou.
Time-Resolved FTIR Difference Spectroscopy in Combination with Specific Isotope Labeling for the Study of A1, the Secondary Electron Acceptor in Photosystem I

11) Physics Department Seminar. Georgia State University. August 19, 2008.
Mr. Hari Lamichanne.
Far-IR Difference Spectroscopy for the Study of Cofactors Involved in Solar Energy Conversion

10) Physics Department Seminar, Tribhuvan University, Kirtipur, Kathmandu, Nepal. May 23, 2008.
Mr. Hari Lamichanne.
FTIR Spectroscopy for the Study of Bacterial Photosynthetic Reaction Centers

9) Physics Department Seminar. Georgia State University. Sept 18, 2008.
Ms. Sreeja Parameswaran.
Solar Energy Conversion in Plants and Bacteria

8) Department of Physics, Agnes Scott College,Atlanta, GA. Nov. 16, 2007.
Dr. Ruili Wang
P700, the Primary Electron Donor in Photosystem I studied using FTIR Difference Spectroscopy

7)* Physics Department Seminar. Georgia State University. May. 1, 2007.
Ms. Priyangi Jayaweera
Time resolved FTIR difference spectroscopy for the study of solar energy conversion in plants and bacteria

6) Department of Physics, Yunnan Normal University, Kunming, China. Dec. 28, 2006.
Dr. Ruili Wang
FTIR Difference Spectroscopy and Its Application in the Study of Photosystem I

5) Physics Department Seminar. Georgia State University. Sept. 29, 2005.
Ms. Ruili Wang
FTIR Difference Spectroscopy for The Study of P700, the Primary Electron Donor in Photosystem I

4) Physics Department Seminar. Georgia State University. July 15, 2004.
Mr. Velautham Sivakumar
Static and Time Resolved FTIR Difference Spectroscopy for the Study of A_1, the Secondary Electron Acceptor in Photosystem I.

3) Physics Department Seminar. Georgia State University. Feb. 26, 2003.
Ms. Ruili Wang
FTIR Difference Spectroscopy In Combination With Isotope Labeling and Site Directed Mutagenesis for the Study of P700, The Primary Electron Donor in Photosystem I

2) Physics Department Seminar. Georgia State University. April 23, 2002.
Mr. Velautham Sivakumar
Fourier Transform Infrared (FTIR) Difference Spectroscopic Studies on Photosystem I

1) Physics Department Seminar. Georgia State University. March 16, 2000.
Ms. Ruili Wang**.** Optical Trapping and Manipulation of Microbes Using Laser Tweezers

c.5) Professional Membership

1) International Society of Photosynthesis Researchers (current).
2) Biophysical Society (Current).
3) Society for Applied Spectroscopy (not current)
4) Coblentz Society (not current)
5) American Physical Society (not current).
6) American Chemical Society (not current)
7) Federation of Analytical Chemistry and Spectroscopy Societies (not current)

d) Teaching, including advising

d.1) Courses Taught

1) Molecular Physics – Phys8420
Spring 1999, Fall 2002, 2006, 2008, 2010, Spring 2014.
2) Optics **–** Phys3800/7800.

Spring 2004-2009. Fall 2012, Spring 2013, Fall 2014, Fall 2016

3) Modern Physics – Phys3401/7460 – Fall 2013-2016.
4) Advanced Physics Laboratory – Phys3300. Spring 2016, Spring 2017.
5) Principles of Physics II – Phys2212K**.** Spring 2016
6) Principles of Physics I – Phys2211K**.** Fall 2011 (x2).
7) Introductory Physics I – Phys1111K. Spring 2010, Fall 2010, Spring 2013 (x2).
8) Introductory Physics II – Phys1112K.
   Fall 1999 (x2), Spring 2000, Fall 2000 (x2), Spring2001, Fall 2001 (x2), Spring 2002, Spring 2003 (x2). Fall 2003, Spring 2004, Fall 2004, Spring 2005, Fall 2005, Spring 2006, Fall 2009, Spring 2012, Spring 2014, Spring 2015.
9) Introductory Physics II – Phys102. Fall 1997.
10) Introductory Physics III – Phys103. Winter 1998, Spring 1998, Fall 1998
11) Integrated Science II – Physics – ISCI-II. Summer 2011.
12) Modern Physics Laboratory II – Phys3902.
    Title: Visible and Infrared Absorption Spectroscopy. Team-taught by 7 faculty.
    Spring 2002-2010
    Renamed: Advanced Physics Laboratory – Phys3902:
    Title: Undergraduate Research in Hastings Laboratory (30 minute talk).
    Fall 2011-2012
14) Gateway to Physics – Phys1000:
    Title: Biophysics (80 minute talk). Fall 2013, Fall 2016.
    Title: Optics (80 minute talk). Fall 2012.

d.2) Thesis and Dissertations

7) Nan Zhao (2014)
   Time Resolved Absorption Spectroscopy for the Study of Electron Transfer Processes in Photosynthetic Systems.
   PhD Thesis Defense Date: 07/10/14.
6) Hiroki Makita (2012)
   Time Resolved Absorption Spectroscopy for the Study of Electron Transfer Processes in Photosynthetic Systems.
   Masters Thesis Defense Date: 07/13/12.
5) Hari P. Lamichhane (2011)
   Calculated Vibrational Properties of Quinones in Photosynthetic Reaction Center.
   PhD Thesis Defense Date: 08/01/11.
4) Jing Guo (2011)
   Diagnosing changes in cells using FTIR microspectroscopy.
   PhD Thesis Defense Date: 04/08/11.
3) Sreeja Parameswaran (2009)
   Solar Energy Conversion in Plants and Bacteria Studied Using FTIR Difference Spectroscopy and Quantum Chemical Computational Methodologies.
   PhD Thesis Defense Date: 05/05/09.
2) Ruili Wang (2005)
   FTIR Difference Spectroscopy Studies of P700, the Primary Electron Donor in Photosystem I.
   PhD Thesis Defense Date:
1) Velautham Sivakumar (2004)
   Static and Time-resolved FTIR Difference Spectroscopy for the Study of A_1, The Secondary Electron Acceptor in Photosystem I.
   PhD Thesis Defense Date: 04/08/11.

d.3) Director of student research

High School Students

1) Matthew Occelli, Fall ‘02. Presidential Assistant Scholar (for high school students).
2) Nickolas Faschiano, Fall ‘03. Presidential Assistant Scholar (for high school students).

Undergraduate Students

1) Rifquat Giwa (Biology). Summer 1998, McNair Scholar
2) Makela Willis (Biology). Summer 1998, McNair Scholar
3) D. Lynn McKee (Physics). Spring 1999 Physics Senior
4) Dwayne Lochhart (Biology). March-May, 2000. Presidential Scholar, August-Dec, ‘00.
5) Antoinette Newman (Biology). Summer 2001, McNair Scholar, Spring ‘02, Biology Senior
6) Micheal M. Cook (Physics). Summer 2002, Physics Senior
7) John Marshall (Physics) . Summer 2003, Physics Senior
8) Douglas Woolley (Physics). Summer 2004, Physics Senior
9) Enrique Carrion (Physics). Summer, Fall 2005, Physics Junior, Presidential Scholar.
10) Mathew Davis (Physics). Fall 2005, Physics Senior
11) Jonathon Maxwell (Physics). Spring 2008, Physics Senior.
12) Lucian Botezat (Physics). Spring 2008 Physics Junior.
13) Patrice Gladden (Biology). Spring 2010. MS Science Education.
14) Kelly Anchors (Physics). Summer 2010. Physics Junior.
15) Adriana Machado (Physics). Spring 2011. Physics Junior.
16) Thomas Wilson (Computer science). Fall 2012. Computer Science Major/Physics Minor.
17) Collier Stephens (Physics). Fall 2012. Physics Senior.
18) Arnold Eng (Chemistry). Fall 2012.
19) Jeremy Ariche (Physics, Moorehouse College). Fall 2013, Spring 2014.
20) Bradley Christopher Kemp (Biology). Spring 2014.
21) Reginald Golden (Physics). Spring 2015.
22) Lamisa Elmaa (Biology). Spring, Summer and Fall 2015, Spring 2016.
23) Ibrahim Robins (Physics), Spring 2016.
24) Filmon Kiros (Physics), Spring Summer and Fall 2016.
25) Michael Nelson (Physics), Spring 2017.
26) Anderson McCall (Physics), Spring 2017.

Graduate student rotations

1) Yasser Hussein (Chemistry). Spring, Summer, Fall ’01, ’02. (unofficial)
2) Micheal Cook (Physics) . Fall ’04.
3) Douglas Woolley (Physics). Summer ’04, Spring ’05.
4) Nileesha Himali (Physics). Fall ’05, Spring, ’06, Summer ’06.
5) Asha Amin (Physics). Fall ‘05
6) Indranil Mitra (Physics). Summer ’06, Fall ’06, Spring ’07.
7) Crystal Smith (Physics). Spring 2011
8) Zeynep Topdemer (Physics). Fall 2013, Spring, Summer and Fall 2014.
9) Jason Rejman (Physics). Spring 2016.

Master of Science

1)	Velautham Sivakumar (Physics)	Awarded Spring 2001
2)	Ruili Wang (Physics)	Awarded Spring 2002
3)	Priyangi Jayawera (Physics)	Awarded Spring 2007
4)	Sreeja Parameswaran (Physics)	Awarded Fall 2007
5)	Hari Lamichane (Physics)	Awarded Fall 2008
6)	Tian Tang (Math/Stats)	Awarded Fall 2008
7)	Patrick Champion (Math/Stats)	Awarded Fall 2008

8) Jing Guo (Physics) Awarded Spring 2009
9) Nan Zhao (Physics) Awarded Spring 2009
10) Hiroki Makita (Physics). Awarded Summer 2012.
11) Venus Saatchi (Physics) Awarded Fall 2014.
12) Leyla Rohani Expected Fall 2017.
13) Jodian Thomas Expected Fall 2017.

Doctor of Philosophy

1) Velautham Sivakumar (Physics) Awarded Spring 2004
2) Ruili Wang (Physics) Awarded Fall 2005
3) Sreeja Parameswaran (Physics) Awarded Summer 2009
4) Priyangi Jayawera (Physics) ABD
6) Jing Guo (Physics) Awarded Spring 2011.
7) Hari Lamichane (Physics) Awarded Fall 2011.
8) Nan Zhao (Physics) Awarded Summer 2014.
9) Hiroki Makita (Physics) Expected Fall 2017.

d.3) Director/Advisor/Mentor to researchers beyond the graduate level

Postdoctoral Fellows (at GSU)

1) Dr. Ruili Wang Spring 2006 – Fall 2010
2) Dr. Hari Lamichhane Spring 2012

Postdoctoral fellows (outside GSU).

1) Advise (unofficially) and set the direction of the photosynthesis research work of Dr. Velautham Sivakumar.
Chemistry Department, Qatar University. Spring 2013 - present

Faculty (outside GSU).

1) Advise and set the direction of the photosynthesis research work undertaken in the laboratory of Dr. Yasser Hussein.
Chemistry Department, Qatar University. Spring 2013 - present

Host to Visiting Scholars (at GSU)

1) Ruili Wang Spring 1999
2) Dr. Yasser Hussein Spring 2014

d.4) Membership on Committees for Individual Student Work.

Chair: Velautham Sivakumar, Ruili Wang, Priyangi Jayawera, Sreeja Parameswaran, Hari Lamichane, Jing Guo, Nan Zhao, Hiroki Makita, Venus Saatchi.
Member: Choi Yoonjeong, Joonsang Lee, Paul Ehrling, Sibel Tokedimer, Jayantha Seniwaratne, Nayana Jayatilaka, Erika Grundstrum, Tian Tang (Math/Stats), Patrick Champion (Math/Stats), Yiying Zhou, Shan Luo (Math/Stats), Dongmei Wang (Math/Stats), Benjamin Ou-Yang (Phys/Astr). Sergio Dieterich (Phys/Astr). Justin Cantrell (Phys/Astr). James Robert Parks IV (Phys/Astr). Ernesto Potdevin (Phys/Astr). Jennifer Winters (Phys/Astr).

e) Service

e.1) Service at GSU

Department level

18) Physics Dept. Space Committee 2013-present
17) Physics Dept. Met with all candidates for nanoplasmonics faculty position and gave my recommendations to search committee. 2014-2016

16) Physics Dept. Lecturer Search Committee (Vaishnav) 2013
15) Physics Dept. Faculty Search Committee (2CI Neuroscience (Briggs)) 2013
14) Physics Dept. Exhibitor, 2012 Quadrennial Physics Congress. Orlando, Fl. 2012
13) Physics Dept. Lecturer Search Committee (Physics x2 (McGimpsey and Wang) 2012
12) Physics Dept. Faculty Search Committee (Biophys/Cond. matt. (Khozonov)) 2012
11) Physics Dept. Tenure review committee (Chair) (Dhamala) 2012
10) Physics Dept. Promotion review committee (Mani) 2011
9) Physics Dept. Faculty Search Committee (Biophysics) 2011
8) Physics Dept. Biophysics Qualifying Exam Committee (Chair) 2006-
7) Physics Dept. Biophysics Curriculum Committee (Chair) 2006-
6) Physics Dept. Pre-tenure review committee (Cymbalyuk) 2007
5) Physics Dept. Chair's Evaluation Committee 2003
4) Physics Dept. Faculty Search Committee (Biophysics) 2003
3) Physics Dept. Faculty Search Committee (Condensed Matter Physics) 2002
2) Physics Dept. Faculty Search Committee (Biophysics) 2002
1) Physics Dept. Dissertation/Thesis Committee (listed above) 1998-Present

College level

5) College of Arts and Sciences Member of Executive Committee 2015-
4) College of Arts and Sciences Member of Promotion and Tenure Review Board 2015-
3) College of Arts and Sciences Member of Executive Committee 2008-2010
2) College of Arts and Sciences Member of Promotion and Tenure Review Board 2008-2010
1) College of Arts and Sciences Member of Graduate Council 2002-2004

University level

1) Member of review committee charged with the review of Research Initiation Grant and Scholarly Support grant proposals. 2014-2016

e.2) Professional Service

e.2.1) Reviewer Projects

Textbooks

3) Reviewed textbook proposal: **"**Introduction to Molecular Vibrations and Computational Analysis of Infrared and Raman Spectra" by Tasumi and Sakamoto. April 2014
2) Reviewed the textbook "Physics" By Giambatista, Richardson and Richardson. Jan. 2007
1) Reviewed the textbook "College Physics" 5th Edition. By J. Wilson and T. Buffa Sept. 2002

Manuscripts

Applied Spectroscopy; Journal of Physical Chemistry B; Journal of the American Chemical Society; Biochemistry; Biophysical Journal; Photosynthesis Research; Journal of Biological Chemistry; Vibrational Spectroscopy; Spectrochimica Acta, Part A: Molecular and Biomolecular Spectroscopy; Biochimica et Biophysica Acta (Bioenergetics and General Subjects volumes); Photochemistry and Photobiology; The Analyst; Journal of Molecular Structure; Journal of Theoretical and Computational Chemistry; Journal of Bioengineering Research; The Journal of Physical Chemistry Letters. 1997-Present

Funding Agency Grant Proposal Reviewer

7) Natural Sciences and Engineering Research Council of Canada Discovery Grants Program. 2016

6) GSU sponsored programs internal grants reviewer 2014-2016
5) Qatar National Research Fund 2013
4) SHARCNET (Shared Hierarchical Academic Research Computing Network). 2007
3) Biotechnology and Biological Sciences Research Council **(**BBSRC) 2006
2) Israeli National Science Foundation 2002
1) National Science Foundation (USA). 2002, 2003, 2006, 2012

e.3) Conference Organizer

2) Conference Organizer, Chair. (2014)
40th Midwest/Southeast Regional Photosynthesis Conference. Oct. 24-26, 2014.
Turkey Run State Park Inn, Marshall, IA.
(http://www.phy-astr.gsu.edu/hastings/semwpm40/index.htm)
1) Conference Organizer, Chair. (2007)
24th Eastern Regional Photosynthesis Conference. April 20-22, 2007.
Marine Biological Laboratory, Woods Hole, MA.

e.4) Service at Conferences

8) Chaired a speaker session at 32nd Annual Eastern Regional Conference in Photosynthesis. Woods Hole, MA. April 17-19, 2015.
7) Selected as a judge tasked with evaluating and ranking student presentations. Physics Graduate Student Association Annual Conference, 4-11-14.
6) Member of student awards committee. 39th Southeast/Midwest Conference in Photosynthesis. Nov. 8-10, 2013.
5) Chaired a speaker session at 28th Annual Eastern Regional Conference in Photosynthesis. Woods Hole, MA. April 2, 2011.
4 Chaired Oral Session on Biophotonics at 76th Annual Meeting of the Southeastern Section of the American Physical Society. Nov. 11–14, 2009. Atlanta, Georgia
3) Chaired Oral Session at 33rd Southeast/Midwest Conference in Photosynthesis. Session II Reaction Centers and Electron Transfer I. (2007)
2) Chaired a speaker session at 22nd Annual Eastern Regional Conference in Photosynthesis (2005).
1) Chaired a speaker session at 20th Annual Eastern Regional Conference in Photosynthesis. Woods Hole, MA. (2003).

e.5) Community Service

7) Organized the "Hang Glider" competition at the 2015 Georgia Science Olympiad.
Georgia State University. February. 14 2015.
6) Designed (from scratch) and organized the "Optics" competition at the 2011 and 2012 Georgia Science Olympiad. Georgia State University.
5) Co-Designed and Organized the "Pentathalon" Competition at the 2010 Georgia Science Olympiad.
Georgia State University, Atlanta, February 11, 2010.
4) Co-Designed and Organized the "Pentathalon" Competition at the 2009 Georgia Science Olympiad.
Georgia State University, Atlanta, February 21, 2009.
3) Designed and Organized the "Simple Machines" Competition at the 2007 Georgia Science Olympiad.
Georgia State University, Atlanta, February 24, 2007.
2) Organized the "Robo Billiards" Competition at the 2003 Science Olympiad Tournament.
Georgia State University, Atlanta, February 22, 2003.
1) Organized the "Battery Buggy" Competition at the 2002 Science Olympiad Tournament.
Georgia State University, Atlanta, February 23, 2002.

Miscellaneous

Awards for Student Work

7) GSU Scientific Computing Conference. Best Poster Award (2nd runner up) Sept. 30, 2016.

Hiroki Makita, Leyla Rohani and Gary Hastings
Infrared Spectroscopy and Vibrational Frequency Calculations for the Study of Electron Transfer in Photosynthetic Protein Complexes.

6) GSU Dissertation Grant Award. $2000. Hiroki Makita Nov. 2015.
Nanosecond time-resolved infrared difference spectroscopy for the study of solar energy conversion in photosystem I.
5) Best oral presentation. Physics Graduate Student Association.
Hiroki Makita April 22, 2015.
Biological Electron Transfer in Photosystem I.
4) Baruch 60 excellence award for best oral presentation from a graduate student.
Hiroki Makita (April 19, 2015).
$P700^{+}A_1^{-}$ Charge Recombination in Photosystem I Occurs in the Marcus Inverted Region. 32nd Eastern regional conference in photosynthesis. Woods Hole. MA.
3) 2014 Molecular Basis of Disease Program Best Poster Award in Computer Science Category.
MBD Research Day. June 13th, 2014.
Nan Zhao. Vibrational properties of quinones in photosystem I reaction centers.
2) Baruch 60 Excellence Award for best poster from a graduate student.
Hari Lamichhanne (2011).
The Q_A Ubiquinone in *Rhodobacter sphaeroides* Photosynthetic Reaction Centers Is Not Strongly Hydrogen Bonded. 28th Eastern regional conference in photosynthesis. Woods Hole. MA.
1) 2011 Molecular Basis of Disease Program Best Poster Award in Computer Science Category.
MBD Research Day. June 17th, 2011.
Nan Zhao. Time-resolved FTIR Difference spectroscopy for the study of A_1, the secondary electron acceptor in photosystem I

CURRICULUM VITAE

Name: Xiaochun He
Rank: Distinguished University Professor
Department: Physics and Astronomy, Georgia State University

I. EDUCATIONAL CREDENTIALS

BS (Physics)	North Western University, P.R. China, 1984
PhD (Physics)	University of Tennessee, U.S.A., 1991

II. PROFESSIONAL CREDENTIALS

Institute of Modern Physics (P.R.C.)	Research Assistant, 1984-1986
University of Tennessee	Research Assistant, 1986-1991
University of Tennessee	Post-doc Associate, 1991-1994
Georgia State University	Post-doc Associate, 1994-1996
Georgia State University	Assistant Research Prof., 1996-1998
Georgia State University	Assistant Professor, 1998-2004
Georgia State University	Associate Professor, 2004-2009
Georgia State University	Professor, 2009-2014
Georgia State University	**Distinguished University Professor, 2014**
IMP, Chinese Academy of Sciences	Visiting Scientist, 2005 - 2009
Lanzhou University, P.R. China	Guest Professor, 2009

III. ADMINISTRATIVE EXPERIENCES

1. Departmental executive committee
2. Departmental academic self-study committee
3. Departmental bylaw committee
4. Departmental colloquium committee
5. Departmental graduate program committee (co-chair)
6. Departmental learning outcome assessment committee
7. College executive committee
8. GSU internal grant review committee
9. GSU radiation safety committee (member and chair)
10. GSU senate

IV. BUSINESS AND PROFESSIONAL EXPERIENCE

A. Service to Profession

1. Institutional Board member of the PHENIX collaboration at RHIC, Brookhaven National Laboratory.
2. PHENIX Run-12 (2012) Run Coordinator.
3. Co-chair of the PHENIX Collaboration Meeting, Atlanta, Georgia, March 26 – 29, 2009.
4. Local organization committee, The 21st International Conference on Ultra-Relativistic Nucleus-Nucleus Collisions (Quark Matter 2009), Knoxville, Tennessee, USA, March 30 – April 4, 2009.
5. Co-hosted (with Megan Connors and Murad Sarsour) sPHENIX Collaboration Meeting, Atlanta, Georgia, Dec 15 – 17, 2016.
6. Editor of Hindawi Publishing Corporation in Advances in High Energy Physics.
7. Referee of Physical Review journals and Reviews of Modern Physics of American Physical Society.
8. Reviewers for NSF and DOE grant proposals

B. Experiments Participated

1. RD10/45 Experiment at Brookhaven National Lab, 1991-1992
2. WA93 Experiment at CERN, 1991-1992
3. RD93/94 Experiment at Brookhaven National Lab, 1993-1994
4. E866 Experiment at Fermi National Accelerator Lab, 1995-2009
5. PHENIX Experiment at Brookhaven National Lab, 1994-Present
6. eRD11/eRD14 – Electron-Ion Collider Detector R&D, since 2014

V. INSTRUCTIONAL ACTIVITIES

A. Courses Taught

1. Introductory Physics
2. Principles of Physics
3. Modern Physics Lab
4. Physical Computational Lab
5. Digital Instrumentation Lab
6. Critical Thinking through Writing
7. Introductory to Nuclear and Particle Physics
8. High Energy Nuclear and Particle Physics
9. Fundamentals of Particles and Interactions

B. Thesis under Directing and Directed

1. Montgomery Steele, PhD, in progress.
2. Beena Meena, PhD, in progress.
3. Cheuk-Ping Wong, PhD, in progress.
4. Tristan Oliver Scott Hasler, “PHENIX Experiment”, PhD, in progress.
5. Olesya Igorevna Sarajlic, “Cosmic Ray Shower Simulation”, PhD, in progress.
6. Xiaohang Zhang, PhD, “Correlations between the Cosmic Ray Flux Variations and the Dynamic Weather”, completed in July 2016.

7. Margaret Jezghani, PhD, "Measurement of p Production and Nuclear Modification in Cu+Au Collisions at $\sqrt{s_{NN}} = 200$ GeV with the PHENIX Detector at RHIC", completed in December of 2015.
8. Mathes Kanishka Dayananda, PhD, "Correlation Studies of Cosmic Ray Flux and Atmospheric and Space Weather", completed in December 2013.
9. Laura Patel, PhD, "Cross Section of bb-bar Production in p+p Collisions at $\sqrt{s} = 500$ GeV Using Like-Sign Dimuons at PHENIX", completed in May of 2013.
10. Abhisek Sen, PhD, "J/ψ Measurement in Au+Au Collisions at $\sqrt{s_{NN}} = 39$ and 62.4 GeV", completed in December of 2012.
11. Abhisek Sen, MS, "J/ψ Flow Analysis from PHENIX Experiment", completed in April 2010.
12. David Camp, MS, "Cosmic Ray Detector Development", completed in December 2011.
13. Matt Morris, directed study for MS, "Low Dose Radiation Measurement and Effects", completed in May of 2010.
14. Christopher Oakley, MS, "Cosmic Ray Shower Flux Measurement and Simulations", completed in fall of 2009.
15. Hai Qu, Ph D, "J/ψ Polarization Measurement in PHENIX Experiment at RHIC", completed in December 2008.
16. Robert Zaballa, PhD, "Do R_{AA} and R_{CP} Quantify Nuclear Medium Effects?", completed in December 2008.
17. Hakmana Sanjeewa, PhD, "Cosmic Ray Shower Simulation with Geant4 in Earth's Atmosphere", completed in May of 2007.
18. Pushpa Wijesinghe, PhD, "Simulation Study of Radiation Dose Calculation from Cosmic Rays", completed in May of 2007.
19. Sumeyye Dural, MS, "Glauber Model and Its Applications for the PHENIX Experiment", completed in May 2004.
20. Xiaorong Wang, PhD, "Strangeness Production and J/ ψ Polarization Study in High Energy Heavy Ion Collisions", co-Advisor, degree was granted at Institute of Particle Physics, Hua-Zhong Normal University, P.R. China, September, 2002.
21. Qin Wang, MS, "PHENIX Detector Simulation in Geant4", completed May 2000.
22. William Lee, PhD, "A Measurement of the Nuclear Dependence of J/ψ and ψ' Production", co-Advisor, completed December 1999.

C. Membership on Committees for Individual Student Work

1. PhD committee member of Hari Guragain.
2. PhD committee member of Hamed Koochakikelardeh.
3. PhD committee member of Churamani Paudel.
4. PhD committee member of Thakshila Madushani Herath Mudiyanselage, present.
5. PhD committee member of Mohammad Hadigheh Javani, defended on Nov 18, 2014.
6. PhD committee member of Ferrol Blackmon, "Virtual Dynamic Tunnel: A Target-Agnostic Assistive User Interface Algorithm for Head-Operated Input Devices", defended on November 11, 2010.
7. PhD committee member of Ayao Mamert Sossah, "Photoionization of the Potassium Isoelectronic Sequence: Ca+ and Transition Metal Ions", defended on July 1, 2010.

8. PhD committee member of Travis Fischer. Prospectus talk was held on November 30, 2009, titled as "Determining the Inclinations of AGN Using Narrow-Line Region Kinematics".
9. MS committee member of Laura Patel, "Analysis of GaN/AlxGa1-xN Heterojunction dual-band Photodetectors using capacitance profiling techniques ", August 18, 2009.
10. PhD committee member of Noel D. Richardson. Prospectus talk was held on April 6, 2009, titled as "Massive Star Journeys Through the HR Diagram".
11. PhD committee member of Ferrol Blackmon, computer science. PhD proposal presentation was given in February, 2009.
12. Margaret Trippe, PhD, "Investigation of the Nature and Variability of 'intermediate-type' Seyfert Galaxies", completed in 2009.
13. PhD committee member of Saida Caballero-Nieves. Prospectus talk was held on March 23, 2009, titled as "A Multiplicity Study of Massive Stars".
14. Mustafa Alevli, PhD, "Growth and characterzation of Indium nitride", completed in Spring of 2008.
15. Viraj Jayaweera, MS / PhD, "Near and far infrared photon detection techniques in semiconductors" completed in 2007.
16. Euwoo Choi, PhD, "Numerical Hydrodynamics of Relativistic Extragalactic Jets", completed 2007.
17. Paramita Barai, PhD, "Modeling the Power Evolution of Classical Double Radio Galaxies over Cosmological Scales", completed in 2006.

D. Undergraduate Research Projects Directed

1. Colten Cross, "Online Monitoring of Cosmic Ray Data", Spring 2017.
2. Reid Simpson, "Aerogel Emission Measurement", Spring 2017.
3. Ryan Hutchins, "Database for Cosmic Ray Measurements", Spring 2017.
4. Andrew Hruschka, "Cosmic Ray Muon Telescope", Fall 2016.
5. Robert Wiesenberg, "Cosmic Ray Neutron Detectors", Fall 2016.
6. Anderson McCall, "DRS4 Data Acquisition System", Spring 2016.
7. Joseph Bennett, "Radiation Sentor Detection", Spring 2016.
8. Todd Elder, "Comparison Study of the Pythia8 and MC@NLO Event Generator", Spring/Fall 2015.
9. Aaron Woychek, "Wireless Geiger Counter Efficiency Study", Fall 2015.
10. Ethan Bower, "Geiger Counter Detector Development", Fall 2014 / Spring 2015.
11. Sawaiz Syed, "Portable Wireless Radiation Detector Network", Spring/Fall 2014.
12. Maria Rusert, "Using Arduino to Read out Geiger Counter", Spring 2013.
13. Nicholas Baughman, "Cloud Chamber", Spring 2012.
14. Matthew Haddad, "Pythia-8 Simulation for PHENIX", since Fall 2011.
15. Stephen Benson, "Forbush Event Observation with Muon Telescope", Spring 2011.
16. Olesya Sitnikova, "Study Cosmic Ray Flux Variations with Earth Climate Conditions", Summer/Fall 2009.
17. Tony Lee, "Computational Physics in C++", Fall 2009.
18. John Aiken, "Programming National Instruments RIO Board with Labview", Sping/Summer 2009.
19. Lucian Botezat, "Neutron Detector Studies", Fall 2008.

20. Kyle Setchel, "GPIB Controller Driver Development", Fall 2007.
21. Ronald Gerald Vaughn, "New Cosmic Ray Counter Prototype and Simulation", Summer and Fall 2007.
22. Jason Yaho, "eMorpho Electronics for Muon Particle Counts", Spring 2007.
23. Jonathan Makarevich, "Gas Analysis for Resistive Plate Chamber", Fall 2006 – Spring 2007.
24. Morgan Callender, "Labview Interface with CAMAC Controller", Fall 2005
25. Nicole Geiger, "A Methodology for Preparing a Cosmic Ray Laboratory for GRID Technology", Fall 2004.
26. David Pattern, "Cosmic Ray Particle Detector Development", 2003.
27. Kyung-Chol Yang, "Neutrino and Weak Interactions", 2003.
28. Steven Gabriel, "Information Entropy of Charged Particle Multiplicity Distributions from High Energy Nuclear Reactions", 2002.
29. Christopher Cleven, "Cosmic Muon Detection and Simulation", 2001.
30. Shinichi Motsumoto, "Computer Simulation of Pion Decays from a Spherical Source", 1997.
31. Dennis Gordon, "Communication Interface between VME and EISA Bus Based PC System", 1996.

VI. INTELLECTUAL CONTRIBUTIONS

A. Publications – Journal Articles (Refereed)

1. "Measurements of Double-helicity Asymmetries in Inclusive J/ψ Production in Longitudinally Polarized p+p Collisions at $\sqrt{s}$ = 510 GeV", A. Adare et al., (X. He), PHENIX Collaboration, Phys. Rev. D **94**, 112008 (2016).

2. "Azimuthal Anisotropic Emission of Low-momentum Direct Photons in Au+Au Collisions at $\sqrt{s_{NN}} = 200$ GeV", A. Adare et al., (X. He), PHENIX Collaboration, Phys. Rev. C **94**, 064901 (2016).

3. "Measurements of Direct, Elliptic, and Triangular Flow in Cu+Au Collisions at $\sqrt{s_{NN}} = 200$ GeV", A. Adare et al., (X. He), PHENIX Collaboration, Phys. Rev. C **94**, 054910 (2016).

4. "Measurements of the Higher-order Anisotropic Flow Coefficients for Identified Hadrons in Au+Au Collisions at $\sqrt{s_{NN}} = 200$ GeV", A. Adare et al., (X. He), PHENIX Collaboration, Phys. Rev. C **93**, 051902(R) (2016).

5. "Centrality-Dependent Modification of Jet-Production Rates in Deutron-Glod Collisions $\sqrt{s_{NN}} = 200$ GeV", A. Adare et al., (X. He), PHENIX Collaboration, Phys. Rev. Lett. **116**, 122301 (2016).

6. "Measurement of Parity-violating Spin Asymmetries in W Production at Midrapidity in Longitudinally Polarized p+p Collisions", A. Adare et al., (X. He), PHENIX Collaboration, Phys. Rev. D **93**, 051103(R) (2016).

7. "Single Electron Yields from Semileptonic Charm and Bottom Hadron Decays in Au+Au Collisions at $\sqrt{s_{NN}} = 200$ GeV", A. Adare et al., (X. He), PHENIX Collaboration, Phys. Rev. C **93**, 034904 (2016).

8. "Forward J/ψ Production in U+U Collisions at $\sqrt{s_{NN}}$ = 193 GeV", A. Adare et al., (X. He), PHENIX Collaboration, Phys. Rev. C **93**, 034903 (2016).

9. "Scaling Properties of Fractional Momentum Loss of High-pT Hadrons in Nucleus-Nucleus Collisions at from $\sqrt{s_{NN}}$ = 62.4 GeV to 2.76 TeV", A. Adare et al., (X. He), PHENIX Collaboration, Phys. Rev. C **93**, 024911 (2016).

10. "ϕ Meson Production in the Forward/Backward Rapidity Region in Cu+Au Collisions at $\sqrt{s_{NN}} = 200$ GeV", A. Adare et al., (X. He), PHENIX Collaboration, Phys. Rev. C **93**, 024904 (2016).

11. "Transverse Energy Distribution and Charge-Particle Multiplicity at Midrapidity in Various Systems from $\sqrt{s_{NN}}$ = 7.7 to 200 GeV", A. Adare et al., (X. He), PHENIX Collaboration, Phys. Rev. C **93**, 024901 (2016).

12. "Measurement of Higher Cumulants of Net-Charge Multiplicity Distributions in Au+Au Collisions at $\sqrt{s_{NN}}$ = 7.7 to 200 GeV", A. Adare et al., (X. He), PHENIX Collaboration, Phys. Rev. C **93**, 011901(R) (2016).

13. "Dielectron Production in Au+Au Collisions at $\sqrt{s_{NN}} = 200$ GeV", A. Adare et al., (X. He), PHENIX Collaboration, Phys. Rev. C **93**, 014904 (2016).

14. "Inclusive Cross Section and Double-Helicity Asymmetry for π^0 Production at Midrapidity in p+p Collisions at $\sqrt{s}$ = 510 GeV", A. Adare et al., (X. He), PHENIX Collaboration, Phys. Rev. D **93**, 011501(R) (2016).

15. "Phi Meson Production at Forward Rapidity in d+Au Collisions at $\sqrt{s_{NN}} = 200$ GeV", A. Adare et al., (X. He), PHENIX Collaboration, Phys. Rev. C **92**, 044909 (2015).

16. "Measurements of Elliptic and Triangular Flow in High-Multiplicity ^{3}He+Au Collisions at $\sqrt{s_{NN}} = 200$ GeV", A. Adare et al., (X. He), PHENIX Collaboration, Phys. Rev. Lett **115**, 142301 (2015).

17. "Systematic Study of Charged-Pion and Kaon Femtoscopy in Au+Au Collisions at $\sqrt{s_{NN}} = 200$GeV", A. Adare et al., (X. He), PHENIX Collaboration, Phys. Rev. C **92**, 034914 (2015).

18. "Systematic Study of Azimuthal Anisotropy in Cu+Cu and Au+Au Collisions at $\sqrt{s_{NN}} = 62.4 - 200$ GeV", A. Adare et al., (X. He), PHENIX Collaboration, Phys. Rev. C **92**, 034913 (2015).

19. "Centrality Dependence of Low-momentum Direct-Photon Production in Au+Au Collisions at $\sqrt{s_{NN}} = 200$ GeV", A. Adare et al., (X. He), PHENIX Collaboration, Phys. Rev. C **91**, 064904 (2015).

20. "Measurement of Long-Range Angular Correlation and Quadrupole Anisotropy of Pions and (Anti)Protons in d+Au Collisions at $\sqrt{s_{NN}} = 200$ GeV", A. Adare et al., (X. He), PHENIX Collaboration, Phys. Rev. Lett **114**, 192301 (2015).

21. "Heavy Quark Production and Elliptic Flow in Au+Au Collisions at $\sqrt{s_{NN}} = 200$ GeV", A. Adare et al., (X. He), PHENIX Collaboration, Phys. Rev. C **91**, 044907 (2015).

22. "Search for Dark Photons from Neutral Meson Decays in p+p and d+Au Collisions at $\sqrt{s_{NN}} = 200$ GeV", A. Adare et al., (X. He), PHENIX Collaboration, Phys. Rev. C **91**, 031901(R) (2015).

23. "Measurement of the Upsilon Cross Section in p+p and Implications to the Nuclear Modification Factor in Au+Au at $\sqrt{s_{NN}} = 200$ GeV", A. Adare et al., (X. He), PHENIX Collaboration, Phys. Rev. C **91**, 024913 (2015).

24. "Charged-pion cross sections and double-helicity asymmetries in polarized p+p Collisions at $\sqrt{s} = 200$ GeV", A. Adare et al., (X. He), PHENIX Collaboration, Phys. Rev. D **91**, 032001 (2015).

25. "The Cross-Section for b-bbar Production via Dielectrons in d+Au Collisions at $\sqrt{s_{NN}} = 200$ GeV", A. Adare et al., (X. He), PHENIX Collaboration, Phys. Rev. C **91**, 014907 (2015).

26. "Nuclear Matter Effects of J/ψ Production in Asymmetric Cu+Au Collisions at $\sqrt{s_{NN}} = 200$ GeV", A. Adare et al., (X. He), PHENIX Collaboration, Phys. Rev. C **90**, 064908 (2014).

27. "Measurement of K^0s and K^{*0} in p+p, d+Au, and Cu+Cu Collisions $\sqrt{s_{NN}} = 200$ GeV", A. Adare et al., (X. He), PHENIX Collaboration, Phys. Rev. C **90**, 054905 (2014).

28. "Cross Section and Transverse Single-Spin Asymmetry of η Mesons in p+p Collisions at $\sqrt{s} = 200$ GeV at Forward Rapidity", A. Adare et al., (X. He), PHENIX Collaboration, Phys. Rev. D **90**, 072008 (2014).

29. "Low Mass Vector Mesons Production at Forward Rapidity in p+p Collisions at $\sqrt{s}$ = 200 GeV", A. Adare et al., (X. He), PHENIX Collaboration, Phys. Rev. D **90**, 052002 (2014).

30. "PHENIX Centrality Categorization in d+Au Collisions at $\sqrt{s_{NN}} = 200$ GeV", A. Adare et al., (X. He), PHENIX Collaboration, Phys. Rev. C **90**, 034902 (2014).

31. "System-Size Dependence of Open-Heavy-Flavor Production in Nucleus-Nucleus Collisions at $\sqrt{s_{NN}} = 200$ GeV", A. Adare et al., (X. He), PHENIX Collaboration, Phys. Rev. C. **90**, 034903 (2014).

32. "Inclusive Double-Helicity Asymmetries in Neutral Pion and Eta Meson Production in p+p Collisions at $\sqrt{s}$ = 200 GeV", A. Adare et al., (X. He), PHENIX Collaboration, Phys. Rev. D. **90**, 012007 (2014).

33. "Measurement of Transverse-single-spin Asymmetries for Midrapidity and Forward-rapidity Production of Hadrons in Polarized p+p Collisions at $\sqrt{s}$ = 200 and 62GeV", A. Adare et al., (X. He), PHENIX Collaboration, Phys. Rev. D. **90**, 012006 (2014).

34. "Cold nuclear matter effects on heavy-quark production at forward and backward rapidities in d+Au collisions at $\sqrt{s_{NN}} = 200$ GeV", A. Adare et al., (X. He), PHENIX Collaboration, Phys. Rev. Lett. 112, 252301 (2014).

35. "Azimuthal-angle dependence of charged-pion-interferometry measurements with respect to 2nd and 3rd-order event plane in Au+Au collisions at $\sqrt{s_{NN}} = 200$ GeV", A. Adare et al., (X. He), PHENIX Collaboration, Phys. Rev. Lett. 112, 222301 (2014).

36. "Transverse-energy distributions at midrapidity in p+p, d+Au, and Au+Au collisions at $\sqrt{s_{NN}} = 62.4 - 200$ GeV and implications for particle-production models", S.S. Adler et al., (X. He), PHENIX Collaboration, Phys. Rev. C. **89**, 044905 (2014).

37. "Heavy-flavor electron-muon correlations in p+p and d+Au collisions at $\sqrt{s}$ = 200 GeV", A. Adare et al., (X. He), PHENIX Collaboration, Phys. Rev. C. **89**, 034915 (2014).

38. "Azimuthal Anisotropy of and mesons in Au+Au Collisions at $\sqrt{s_{NN}} = 200$ GeV", A. Adare et al., (X. He), PHENIX Collaboration, Phys. Rev. C. **88**, 064910 (2013).

39. "Quadrupole Anisotropy in Dihadron Azimuthal Correlations in Central d+Au Collisions at $\sqrt{s_{NN}} = 200$ GeV", A. Adare et al., (X. He), PHENIX Collaboration, Phys. Rev. Lett. 111, 212301 (2013).

40. "Nuclear Modification of ψ', χ_C and J/ψ production in d+Au Collisions at $\sqrt{s_{NN}} = 200$ GeV", A. Adare et al., (X. He), PHENIX Collaboration, Phys. Rev. Lett. 111, 202301 (2013).

41. "Spectra and Ratios of Identified Particles in Au+Au and d+Au Collisions at $\sqrt{s_{NN}} = 200$ GeV", A. Adare et al., (X. He), PHENIX Collaboration, Phys. Rev. C. **88**, 024906 (2013).

42. "Inclusive Cross Section and Single Transverse Spin Asymmetry for Very Forward Neutron Production in Polarized p+p Collisions at $\sqrt{s} = 200$ GeV", A. Adare et al., (X. He), PHENIX Collaboration, Phys. Rev. D. **88**, 032006 (2013).

43. "Medium Modification of Jet Fragmentation in Au+Au Collisions at $\sqrt{s_{NN}} = 200$ GeV Measured in Direct Photon-Hadron Corelations", A. Adare et al., (X. He), PHENIX Collaboration, Phys. Rev. Lett. **111**, 32301 (2013).

44. "Direct Photon Production in d+Au Collisions at $\sqrt{s_{NN}} = 200$ GeV ", A. Adare et al., (X. He), PHENIX Collaboration, Phys. Rev. C. **87**, 054907 (2013).

45. "Upsilon (1S+2S+3S) Production in d+Au and p+p Collisions at $\sqrt{s_{NN}} = 200$ GeV and Cold-nuclear Matter Effects", A. Adare et al., (X. He), PHENIX Collaboration, Phys. Rev. C. **87**, 044909 (2013).

46. "Neutral Pion Production with Respect to Centrality and Reaction Plane in in Au+Au Collisions at $\sqrt{s_{NN}} = 200$ GeV", A. Adare et al., (X. He), PHENIX Collaboration, Phys. Rev. C. **87**, 034911 (2013).

47. "Transverse-momentum Dependence of the J/ψ Nuclear Modification in d+Au Collisions at $\sqrt{s_{NN}} = 200$ GeV", A. Adare et al., (X. He), PHENIX Collaboration, Phys. Rev. C. **87**, 034904 (2013).

48. "Double Spin Asymmetry of Electrons from Heavy Flavor Decays in p+p Collisions at $\sqrt{s} = 200$ GeV", A. Adare et al., (X. He), PHENIX Collaboration, Phys. Rev. D. **87**, 012011 (2013).

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B. Proceedings (selected)

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9. "Neutral Pion Distributions in PHENIX at RHIC", G. David for the PHENIX Collaboration, Proceedings of Quark Matter 2001, Nucl. Phys. **A698,** 227-232 (2002).

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35. "Signature Of Multiple Collisions in Proton-Nucleus Reactions", C. C. Shih, X.C. He, J. Y. Zhang, S. P. Sorensen, and C. Y. Wong, Ninth International Conference on Ultra-Relativistic Nucleus-Nucleus Collisions (Quark Matter'91), Gatlinburg, Tennessee, November 11-15, 1991, p.T30.

36. "Study of the Transverse Energy Distribution In Pseudorapidity", J. Y. Zhang, X.C. He, C. C. Shih, S. P. Sorensen, and C. Y. Wong, Ninth International Conference on Ultra-Relativistic Nucleus-Nucleus Collisions (Quark Matter'91), Gatlinburg, Tennessee, November 11-15, 1991, p.T25.

37. "Linked Pair Formulation With A Pt Spectrum", Chia C. Shih and X. C. He, Proceedings, Intermittency in High Energy Collisions, Santa Fe, March 1990, Santa Fe, NM, World Scientific (Singapore), p.377-38

C. Professional Presentations

1. "ϕ Meson Measurements at Forward/Backward Rapidity at RHIC with PHENIX Detector", Xiaochun He, Annual Fall Meeting of the Division of Nuclear Physics, Vancouver, BC, Canada, October 13-16, 2016,

2. "Performance Study of a Prototype Modular RICH Detector for EIC Experiments", presented by Cheuk-Ping Wong, Annual Fall Meeting of the Division of Nuclear Physics, Vancouver, BC, Canada, October 13-16, 2016,

3. "Study of Cosmic Ray Muon Lateral Distribution with Geant4 Simulation", presented by Olesya Sarajlic, Annual Fall Meeting of the Division of Nuclear Physics, Vancouver, BC, Canada, October 13-16, 2016,

4. "Recent Heavy Flavor Measurements from ϕ Results of the sPHENX Prototype Hadronic Calorimeter Beam Test", X. He for the sPHENIX collaboration, poster presentation at the 8th International Conference on Hard and Electromagnetic Probes of High-Energy Nuclear Collisions (Hard Probe 2016), Wuhan, China, September 23-27, 2016.

5. "Reports from PHENIX", X. He for the PHENIX collaboration. Invited talk at the 8th International Conference on Hard and Electromagnetic Probes of High-Energy Nuclear Collisions (Hard Probe 2016), Wuhan, China, September 23-27, 2016.

6. "Recent Heavy Flavor Measurements from PHENIX and RHIC", Tristan Hasler (PhD student) for the PHENIX collaboration, contributed talk at the XIIth International Conference on Beauty, Charm, and Hyperons in Hadronic Interactions, George Mason University, Fairfax, Virginia, June 12-18, 2016.

7. "Prototype Studies of the Hadronic Calorimeter Systems of the Proposed New Experiment (sPHENIX) at RHIC" poster presentation by Xiaochun He for the PHENIX Collaboration, XXV International Conference on Ultrarelativistic Nucleus-Nucleus Collisions (QM2015), Kobe, Japan, Sep 27 to Oct 3, 2015.

8. "ϕ Meson Measurement in Cu+Au Collisions at $\sqrt{s_{NN}} = 200$GeV with the PHENIX Muon Arms at RHIC" poster presentation by Margaret Jazghani for the PHENIX Collaboration, XXV International Conference on Ultrarelativistic Nucleus-Nucleus Collisions (QM2015), Kobe, Japan, Sep 27 to Oct 3, 2015.

9. "Studies of the Hadronic Calorimeter Prototype for sPHENIX", presented by Liang Xue for the PHENIX Collaboration, APS April Meeting 2015, Baltimore, MD, April 11-14, 2015.

10. "Simulation Study of RICH Detector for Particle Identification in Forward Region at Electron-Ion Collider", presented by Cheuk-Ping Wong for eRD11 R&D Collaboration for EIC, APS April Meeting 2015, Baltimore, MD, April 11-14, 2015.

11. "Geant4-based Simulation Study of Cosmic Ray Showers and the Associated Applications", Olesya Sarajlic (presenter) and Xiaochun He, APS April Meeting 2015, Baltimore, MD, April 11-14, 2015.

12. "Studying Stratospheric Temperature Variation with Cosmic Ray Measurements", Xiaohang Zhang (presenter) and Xiaochun He, APS April Meeting 2015, Baltimore, MD, April 11-14, 2015.

13. "Becoming a Scientist: Development of Research Skills through Senior Research Projects" plenary presentation, Sawaiz Syed (presenter), Brian Thoms, and Xiaochun He, SACS-AAPT 2014, October 24 – 25, 2014, Charleston, SC.

14. "Development of Low-cost and Robust Radiation Sensor Network" poster presentation, Sawaiz Syed (presenter), Brian Thoms, and Xiaochun He, SACS-AAPT 2014, October 24 – 25, 2014, Charleston, SC.

15. "PHENIX Highlights", invited plenary talk, presented by X. He for the PHENIX Collaboration, XXIV International Conference on Ultrarelativistic Nucleus-Nucleus Collisions (QM2014), Darmstadt, Germany, May 19-24, 2014.

16. "Study of J/ψ Production from Beauty Decays in p+p Collisions in PHENIX at RHIC with the FVTX Detector", poster presentation by Margaret Jezghani for the PHENIX Collaboration, XXIV International Conference on Ultrarelativistic Nucleus-Nucleus Collisions (QM2014), Darmstadt, Germany, May 19-24, 2014.

17. "Low Mass Vector Meson Production in p+p Collisions at Forward Rapidity at $\sqrt{s} = 200$ and 500 GeV at RHIC", poster presentation by Raphael Tieulent for the PHENIX

Collaboration, XXIV International Conference on Ultrarelativistic Nucleus-Nucleus Collisions (QM2014), Darmstadt, Germany, May 19-24, 2014.

18. "Low Mass Vector Meson (ω, ρ and ϕ) Production at Forward Rapidity in d+Au Collisions at $200\ \mathrm{GeV}$", poster presentation by Murad Sarsour for the PHENIX Collaboration, XXIV International Conference on Ultrarelativistic Nucleus-Nucleus Collisions (QM2014), Darmstadt, Germany, May 19-24, 2014.

19. "The Hadronic Calorimeter Prototype for sPHENIX Experiment at RHIC", poster presentation by Liang Xue for the PHENIX Collaboration, XXIV International Conference on Ultrarelativistic Nucleus-Nucleus Collisions (QM2014), Darmstadt, Germany, May 19-24, 2014.

20. "Quarkonia Physics at RHIC", invited talk, presented by X. He, International Workshop on Future Trends in High-Energy Nuclear Collisions, Beijing, China, August 19-23, 2013.

21. "Cold Nuclear Matter and ψ' from PHENIX", invited talk, presented by X. He, Rencontres de Moriond (QCD and High Energy Interactions), La Thuile, Italy, March 9-16, 2013.

22. "Recent Exciting Results from PHENIX", invited talk, presented by X. He, for the PHENIX Collaboration, Asian Triangle Heavy Ion Conference, Pusan, South Korean, November 14-17, 2012.

23. "The View from PHENIX", presented by X. He, for the PHENIX Collaboration, RHIC Run-12 Retreat, Bellport, New York, July 25-27, 2012.

24. "PHENIX Run-12 Heavy Ion Report", presented by X. He, for the PHENIX Collaboration, the 2012 RHIC/AGS Annual Users' Meeting, Upton, New York, June 12-15, 2012.

25. "Recent Results from PHENIX", invited talk, SESAPS 2011, Roanoke, Virginia, USA, October 18-22, 2011.

26. "Correlation Study of Atmospheric Weather and Cosmic Ray Flux Variation", presented by Kanishka Dayananda, SESAPS 2011, Roanoke, Virginia, USA, October 18-22, 2011.

27. "Constructing a Two-Scintillator-Paddle Telescope for Cosmic Ray Flux Measurement", presented by David Camp, SESAPS 2011, Roanoke, Virginia, USA, October 18-22, 2011.

28. "Heavy Flavor Measurements in PHENIX", invited talk, SQM2011, Krakow, Poland, September 19-24, 2011.

29. "Quarkonium Production and Suppression vs Energy at PHENIX", presented by Abhisek Sen, for the PHENIX Collaboration, QM2011, Annecy, France, May 22-28, 2011.

30. "Recent Results from the RHIC Heavy Ion Program", presented by X. He, for the PHENIX Collaboration, 2nd International Workshop on Multiple Partonic Interactions at the LHC, Glasgow, UK, November 29 – December 3, 2010.

31. "Results from the PHENIX RPC R&D and Long-term Performance Monitoring", presented by X. He, for the PHENIX Collaboration, X. Workshop on Resistive Plate Chambers and Related Detectors, GSI, Darmstadt, Germany, February 9-12, 2010.

32. "Multi-spectra Cosmic Ray Flux Measurement", X. He and Mathes Dayananda, APS April Meeting 2010, Washington DC, February 13-17, 2010.

33. "J/ψ Flow Analysis for Au+Au Data from PHENIX ", presented by Abhisek Sen, 76th Annual Meeting of the Southeastern Section of APS, Atlanta, USA, November 11-14, 2009.

34. "Cosmic Ray Neutron Measurement", presented by Mathes Dayananda, 76th Annual Meeting of the Southeastern Section of APS, Atlanta, Georgia, USA, November 11-14, 2009.

35. "Simulation Study of Radiation Dose Calculation from Cosmic Ray Muons at Sea Level", invited, Pushpa Wijesingher (presenter) and Xiaochun He, American Nuclear Society: 2009 Annual Meeting, Atlanta, Georgia, USA, June 14-18, 2009.

36. "Effect of Weather Condition on the Muon Flux Distributions", poster, presented by Olesya Sitnikova, 76th Annual Meeting of the Southeastern Section of APS, Atlanta, USA, November 11-14, 2009.

37. "PHENIX Detector Upgrade for Triggering Fast Muons from W-Boson Decays Using RPC Technology", The 18th International Symposium on Spin Physics, Charlottesville, Virginia, USA, October 6-11, 2008.

38. "From Muon Science to Muon Collider", International Workshop on Physics Researches at HIRFL-Cooler Storage Rings, Lanzhou, P.R. China, July 4-8, 2008.

39. " Simulation Study of Sea-level Cosmic Radiation in a Human Body Phantom and Shielding Effects", P. Wijesinghe and X. He, 11th International Conference on Radiation Shielding & 15th Topical Meeting of the Radiation Protection & Shielding Division of ANS, Callaway Gardens, Pine Mountain, Georgia, USA, April 13-18, 2008.

40. "A Simplified Model for Calculating RAA and RCP of Cold Nuclear Matter Effects", Robert Zaballa and X. He, poster presentation at Quark Matter 2008 Conference, Jaipur, India, February 4-10, 2008.

41. “Resistive Plate Chamber R&D at GSU”, Jun Ying, Kanishka Dayananda and X. He, The PHENIX Forward Muon Trigger Quarterly Meeting, Brookhaven National Laboratory, November 30, 2007.

42. “Resistive Plate Chamber Studies at GSU”, X. He, Jun Ying and Kanishka Dayananda. The PHENIX Forward Muon Trigger Quarterly Meeting, Brookhaven National Laboratory, September 9, 2007.

43. “Muon Trigger – RPC”, X. He, The PHENIX Forward Upgrade Workshop, Santa Fe, May 15, 2007.

44. “Resistive Plate Chamber R&D at GSU “Jun Ying, X. He and Carola Butler, The PHENIX Forward Muon Trigger Quarterly Meeting, Brookhaven National Laboratory, April 12, 2007.

45. “Measurement of J/ψ Polarization from Muon Decay Channel in p+p Collisions at $\sqrt{s} = 200$ GeV in PHENIX at RHIC”, Hai Qu for the PHENIX Collaboration, poster presentation at Quark Matter 2006, Shanghai, China, November 14-20, 2006.

46. “PHENIX Forward Muon Trigger Upgrade at RHIC", X. He for the PHENIX Collaboration, poster presentation at Quark Matter 2006, Shanghai, China, November 14-20, 2006.

47. “RPC Prototypes for the PHENIX Forward Muon Trigger Upgrade at RHIC”, Jun Ying for the PHENIX Collaboration, DNP 2006, Nashville, Tennessee, October 2006.

48. "GEANT4 Simulations of Muon Tracks and Energy Deposition in Tissue Like Materials”, Poster Presentation by Pushpa Wijesinghe, ASA 2006 Radiation conference, Monterey, CA, June 18-21, 2006.

49. “Nuclear Medium Effects on Heavy Flavor Production at RHIC”, X. He, an invited talk at HCP2006, Duke University, May 26, 2006.

50. “Air Shower Development Program for Cosmic Ray Study”, Invited talk given by Hakmana Sanjeewa at 19th International conference on the Application of Accelerators in Research and Industry, Fort Worth, Texas, 20th August 2006.

51. “Influence of the Geomagnetic Field and Atmospheric Air Density for the Development of Air Shower”, presented by Hakmana Sanjeewa, 9th Conference on the Intersection of Particle and Nuclear Physics, Puerto Rico, 30th June 2006.

52. “GEANT4-Based Simulation of Cosmic Ray Shower Development in the Earth Atmosphere", X. He, DNP/JPS Join Fall Meeting, Kapalua, Hawaii, September 18-25, 2005.

53. "J/ψ Polarization Measurement via the Dimuon Decay Channel from Cu+Cu Collisions at $\sqrt{s_{NN}} = 200$ GEV at RHIC", X. He for the PHENIX Collaboration, poster presentation at Quark Matter 2005, Budapest, Hungary, August 5-9, 2005.

54. "GEANT4 Simulation of Charged Particle Interaction with Water", P. Wijesinghe (presenter) and X. He, the First International Workshop on Frontiers in Targeted Radiation Therapies, Purdue University, April 11, 2005.

55. "Event Tagging and Filtering – the PHENIX Level-2 Trigger", X. He, et. al., for the PHENIX collaboration, poster presentation, Quark Matter 2004, January 11-17, 2004, Oakland, California.

56. "J/ψ Polarization Study for d+Au Collisions at RHIC", X.R. Wang, et. al. (X. He), for the PHENIX collaboration, poster presentation, Quark Matter 2004, January 11-17, 2004, Oakland, California.

57. "Study of J/ψ Polarization in p+p Collisions at $\sqrt{s_{NN}} = 200$ GeV with the PHENIX Experiment at RHIC", G.C. Mishra, et. al. (X. He), for the PHENIX collaboration, poster presentation, Quark Matter 2004, January 11-17, 2004, Oakland, California.

58. "Feasibility Study of Extracting J/ψ Polarization from PHENIX Run2 pp Data", presented by Xiaorong Wang, June 16, 2003, PHENIX Muon Arm Group Meeting, Santa Fe.

59. "Acceptance Calculation for J/ψ Polarization Measurement", presented by Gobinda Mishra, October 31, 2002, PHENIX Heavy Physics Working Group Meeting, Brookhaven National Laboratory.

60. "Nuclear Dependence of J/ψ and ψ' Production", presented by William Lee, Centennial Meeting of the American Physical Society, 20-26 March 1999.

61. "Nuclear Dependence of J/ψ and ψ' Production**"**, presented by William Lee, 28-31 October, 1998, Fall Meeting, Division of Nuclear Physics, American Physical Society.

62. "Nuclear Dependence in J/ψ and ψ' Production**",** presented by William Lee, Paris, France, 24-28 Aug 1998, International Nuclear Physics Conference.

Colloquia Presented at Other Institutions

1. "Radiation Detection", X. He, presented at Northwestern Polytechnic University, Xi'an, P.R. China, September 23, 2015.

2. "Fun with Cosmic Rays and the Associated Applications", X. He, Taiyuan, P.R. China, September 17, 2015.

3. "Fun with Cosmic Rays", X. He, presented at Institute of Modern Physics, CAS, Lanzhou, P.R. China, August 22, 2013.

4. "Particle Radiation Detection", X. He, presented at Northwestern Polytechnic University, Xi'an, P.R. China, July 22, 2013.

5. "Cosmic Ray Triggers and Sensors", X. He, presented at Shanghai Institute of Applied Physics, CAS, Shanghai, P.R. China, December 27, 2011.

6. "Study of the Initial Temperature of the Big Bang with the Relativistic Heavy Ion Collider", X. He, presented at University of Georgia on January 27, 2011.

7. "Recent Results from RHIC – Measuring the Initial Temperature of the Big Bang", invited seminar, Argonne National Laboratory, Argonne, IL, May 26, 2010.

8. "Quark Gluon Plasma – QCD Matter and the Early Universe", Lanzhou University, Lanzhou, P.R. China, June 15, 2009.

9. "Catching Cosmic Ray Particles", Lanzhou University, Lanzhou, P.R. China, July 10, 2008.

10. "Cosmic Ray Shower Simulation And The Applications", China Institute of Atomic Energy, Beijing, P.R. China, November 7, 2006.

11. "From RHIC Collider To Big Band", University of West Georgia, April 15, 2005.

12. "Relativistic Heavy Ion Physics at RHIC – Recent Results", Beijing University, Beijing, P.R. China, July 10, 2002.

13. "Relativistic Heavy Ion Physics at RHIC – Recent Results", China Institute of Atomic Energy, Beijing, P.R. China, July 9, 2002.

14. "PHENIX/RHIC Experiment", Institute of Modern Physics, Lanzhou, P.R. China, July 25, 2002.

15. "Embedded High Level Trigger System For The E866 Experiment at FNAL", Iowa State University, Ames, Iowa, August 27, 1997.

D. Editorial/Reviewer Projects

1. NSF grant proposal titled "Nuclear Structure and Reactions", #1307188, December 2012.

2. "College Physics", by Michael Strauss, reviewed one chapter on "Conservation of Energy", December 2011.

3. "Computational Physics", by V.K. Mittal, R.C. Verma and S.C. Gupta, Taylor and Francis acquisition review, 2008.

4. "Physics", by D. Zimmerman, 1st Draft, Chapters 27, 28, 29 and 30, McGraw Hill Higher Education, 2008.

5. DOE supplemental grant proposal titled "Studies in High Energy Heavy Ion Physics" by Prof. Gerald Haffmann, University of Texas, 2006.

6. "PHYSICS" by James Walker, 2nd Edition, Prentice Hall, 2003.

7. "College of Physics" by Wilson and Buffa, 4th and 5th Editions, Prentice Hall 2002.

8. DOE grant proposal titled "Research on Heavy Ion Nuclear Physics" by Prof. Stephen Sanders, University of Kansas, 2002.

E. Grants and External Funding

1. US Department of Energy, "Research in Heavy Ion Nuclear Reactions", 04/01/2016 – 03/31/2019, $680,000 (PI), Murad Sarsour (co-PI).

2. Brookhaven National Laboratory, subcontract grant, "RICH Detector for the EIC's Forward Region Particle Identification", $30k, 10/1/2014 to 9/30/2015; $52k, 10/1/2015 to 9/30/2016, and $49.7k from 10/1/2016 to 9/30/2017 (PI).

3. US Department of Energy, "Research in Heavy Ion Nuclear Reactions", 04/01/2014 – 03/31/2016, $310,000 (PI).

4. US Department of Energy, supplemental grant for "Research in Heavy Ion Nuclear Reactions", $25,000 for the project period of 03/01/2012 – 03/31/2013.

5. US Department of Energy, "Research in Heavy Ion Nuclear Reactions", 04/01/2011 – 03/31/2014, $463,000 (PI).

6. US Department of Energy, "Research in Heavy Ion Nuclear Reactions", 04/01/2008 – 03/31/2011, $465,000 (PI).

7. Georgia State University Chancellor's Initiative Fund, "Research in Interactions of Radiation with Matter", $87,000 per year permanent funding (PI: A. G. U. Perera, Co-PIs: Xiaochun He, S. Manson, W. H. Nelson, M. Stockman, and N. Dietz).

8. Conference grant from Georgia State University Research Foundation for hosting the PHENIX Collaboration Meeting in Atlanta from March 26 to 29, 2009. The grant amount is $3k.

9. US Department of Energy, "Research in Heavy Ion Nuclear Reactions", 04/01/05 – 03/31/08, $144,000 received for the first year. $137,000 received for the second year, $138,000 received for the third year (PI).

10. US Department of Energy, "Research in Heavy Ion Nuclear Reactions", 04/01/02 – 03/31/05, $97,000 received for the first year; $130,000 for the second year; $134,000 for the third year (PI).

11. US Department of Energy, "Research in Heavy Ion Nuclear Reactions", 01/01/99 – 03/31/02, $346,827 (PI).

12. US Department of Energy, "Research in Heavy Ion Nuclear Reactions", 04/01/98 – 03/31/99, $75,000 (PI).

13. US Department of Energy, "Research in Heavy Ion Nuclear Reactions", 06/01/96 – 05/31/97, $65,000 (co-PI, with PI: G.A. Petitt).

14. Brookhaven National Laboratory, "Event Builder Upgrade for the PHENIX Experiment at Brookhaven National Lab", 12/21/99 - 06/30/02, $94,821 (PI).

15. GSU Research Equipment Grant, "Level-2 Trigger System for the PHENIX Experiment at GSU", 1998-99, $15,000 (PI).

16. GSU Research Team Grant, " ", 07/01/99 – 06/30/2000, $9,000 (co-PI with Dr. G. Chen, PI).

17. GSU Research Team Grant, "High Speed Distributed Trigger Algorithm for the PHENIX/RHIC Experiment at GSU", 07/01/2000 – 06-30/01, $15,000 (PI with co-PIs: G. Chen, M. Weeks and K. Balakishnan).

18. GSU Chancellor's Initiative Fund, "Research in Interactions of Radiation with Matter", 07/01/00 – 06/30/01, $70,000 (co-PI, with PI: A.G.U. Perera, co-PIs: S. Manson, W.H. Nelson, and F. Hsu).

19. GSU Chancellor's Initiative Fund, "Research in Interactions of Radiation with Matter", 07/01/01 – 06/30/02, $75,000 (co-PI, with PI: A.G.U. Perera, co-PIs: S. Manson, W.H. Nelson, and N. Dietz).

20. GSU Chancellor's Initiative Fund, "Research in Interactions of Radiation with Matter", 07/01/02 – 06/30/03, $75,000 (co-PI, with PI: A.G.U. Perera, co-PIs: S. Manson, W.H. Nelson, and M. Dietz).

F. Educational Outreach Grants

1. USG STEM mini-Grant, "Advanced Hands-on Real-World Technology Development for Physics 3300 (Advanced Physics Lab)", 7/1/2011 – 6/30/2012, $3,100 (PI).

2. PRISM Mini-grant, "Collaboration between Physicists, Science Teachers, and Students to Study Cosmic Ray Particles", 01/01/08 – 12/31/08, $15,000 (PI).

3. PRISM Mini-grant, "Collaboration between Physicists, Science Teachers, and Students to Study Cosmic Ray Particles", 01/01/07 – 12/31/07, $15,000 (PI).

4. PRISM Mini-grant, "Collaboration between Physicists, Science Teachers, and Students to Study Cosmic Ray Particles", 01/01/06 – 12/31/06, $15,000 (PI).

5. Fermi National Accelerator Laboratory, "QuarkNet Participation", 06/01/03 – 05/31/04, $4,400 (PI).

VII. PROFESSIONAL AND HONOR ORGANIZATION ACTIVITIES

A. Membership

1. American Physical Society
2. Oversea Chinese Physicist Association
3. Member of the Editorial Board in Advances in High Energy Physics in the Hindawi Publishing Corporation.

Outreach Presentations

1. "Nuclear Reactions and Radiation Protection", Panel on the Disaster in Japan at Georgia State University, March 29, 2011.

2. "Cosmic Ray Measurement", Memorial Middle School, Conyers, Georgia, October 27, 2009.

3. "Fun Physics Camp", co-organizer with Unil Perera, Mark Geil and Cherilynn Morrow, June 22-26, 2009

4. "Catching Cosmic Ray Particles", Professional Development Day for Clayton Teachers, Clayton County, Georgia, January 27, 2009.

5. "Catching Cosmic Ray Particles with Scientists at Georgia State University", Southern Atlantic Coast Section Meeting, American Association of Physics Teachers, Kennesaw State University, October 25, 2008.

6. "Catching Cosmic Ray Particles with Scientists at Georgia State University", Conyers Middle School, May 2, 2008.

7. "Training Science Teachers to Perform Cosmic Ray Muon Observations: An Immersion into Scientific Inquiry", J. Wilson and X. He, ASTE 2008, St. Louis, MO, January 10-12, 2007.

8. "COSMIC RAY Muon Measurement", J. Wilson and X. He, South Atlanta School of Law and Social Justice, Atlanta, Georgia, November 7, 2007.

9. "Collaborations Between Scientists and Educators", J. Wilson, X. He and L. Martin-Hansen, SASTE 2007, Valdosta, Georgia, October 27, 2007.

10. "RESEARCH AND EDUCATION – THE INSEPARABLE DUAL", X. He, SASTE Conference at the University of Georgia, Athens, Georgia, October 15, 2005.

11. "COSMIC RAY MUON PROJECT IN GEORGIA", X. He, Georgia State University, September 7, 2005.

12. "COSMIC RAY Muon PROJECT IN GEORGIA", X. He, Cross Keys High School, Georgia, January 20, 2005.

13. "COSMIC RAY EXPERIMENT AT GRIFFIN MIDDLE SCHOOL", X. He, Griffin Middle School, Smyrna, Georgia, November 17, 2004.

14. "COSMIC RAY MUON PROJECT IN GEORGIA", X. He, Kennesaw State University, September 20, 2004.

15. "COSMIC RAY MUON PROJECT", X. He, PRISM Conference at Georgia Tech, June 24, 2004.

16. "COSMIC RAY EXPERIMENT AT CAMBELL HIGH SCHOOL", X. He, Cambell High School, Smyrna, Georgia, November 17, 2003.

17. "COSMIC RAY EXPERIMENT", X. He and Carola Butler, Holly Innocence Christian School, Atlanta, Georgia, April 9, 2003.

18. "COSMIC RAY EXPERIMENT", X. He, North Springs High School, Atlanta, Georgia, March 5, 2003.

19. "COSMIC RAY EXPERIMENT", X. He, Fayette County High School, Fayetteville, Georgia, February 5, 2003.

20. "COSMIC RAY EXPERIMENT", X. He, Chapel Hill High School, Douglasville, Georgia, November 15, 2002.

21. "COSMIC RAY EXPERIMENT AT GRIFFIN MIDDLE SCHOOL", X. He, Griffin Middle School, Smyrna, Georgia, October 16, 2002.

VIII. **HONORS, AWARDS AND RECOGNITION**

1. 2008 Carl R. Nave Outstanding Educator Award.

Todd J. Henry

Education

1991 **Ph.D. in Astronomy**
University of Arizona, Tucson, AZ
Graduate Advisor: Donald W. McCarthy, Jr.

1986 **B.A. in Physics/Planetary Sciences**
Cornell University, Ithaca, NY
Twice Recipient of the Cornell Tradition Fellowship
Undergraduate Advisors: W. Reid Thompson & Carl Sagan

Professional History

2013 **Distinguished University Professor of Astronomy**
Georgia State University, Atlanta, GA

2006 **Professor of Astronomy**
Georgia State University, Atlanta, GA

2000 **Associate Professor of Astronomy**
Georgia State University, Atlanta GA

1999 **Project Scientist for NASA's Nearby Stars Project**
Johns Hopkins University, Baltimore, MD

1997 **Research Astronomer**
Harvard-Smithsonian Center for Astrophysics, Cambridge, MA

1994 **Hubble Fellow**
Space Telescope Science Institute, Baltimore, MD

1991 **Postdoctoral Fellow with SETI Project Phoenix**
Space Telescope Science Institute, Baltimore, MD

Awards

2012 Carl R. Nave Award for Outstanding Educator in Physics & Astronomy

2010 Nominee, Georgia State University Outstanding Faculty Scholar

2008 Nominee, Georgia State University Outstanding Faculty Teacher

2007 Scottish University Physics Alliance Distinguished Visitor

Refereed Journal Publications

107. Winters, J.G., Sevrinsky, R.A., Jao, W.C., **Henry, T.J.**, Riedel, A.R., Subasavage, J.P., Lurie, J.C., Finch, C.T., & Ianna, P.A. 2017, *The Solar Neighborhood XXXVIII: Results from the CTIO/SMARTS 0.9m — Trigonometric Parallaxes for 151 Nearby M Dwarf Systems*, AJ, 153, 14

106. Jao, W.C., Nelan, E.P., **Henry, T.J.**, Franz, O.G., & Wasserman, L.H. 2016, *Cool Subdwarf Investigations III: Dynamical Masses of Low-metallicity Subdwarfs*, AJ, 152, 153

105. Jao, W.C, **Henry, T.J.**, Riedel, A.R., Winters, J.G., Slatten, K.J., & Gies, D.R. 2016, *Distance-dependent Offsets between Parallaxes for Nearby Stars and Gaia DR1 Parallaxes*, ApJ, 832, 18

104. Benedict, G.F., **Henry, T.J.**, Franz, O.G., McArthur, B.E., Wasserman, L.H., Jao, W.C, Cargile, P.A., Dieterich, S.B., Bradley, A.J., Nelan, E.P., & Whipple, A.L. 2016, *The Solar Neighborhood XXXVII: The Mass-Luminosity Relation for Main-sequence M Dwarfs*, AJ, 152, 141

103. Chatelain, J.P., **Henry, T.J.**, French, L.M., Winters, J.G., & Trilling, D.E. 2016, *Photometric Colors of the Brightest Members of the Jupiter L5 Trojan Cloud*, Icarus, 271, 158

102. Gagne, J., Plavchan, P., Gao, P., Anglada-Escude, G., Furlan, E., Davison, C., Tanner, A., **Henry, T.J.**, Riedel, A.R., Brinkworth, C., Latham, D., Bottom, M., White, R., Mills, S., Beichman, C., Johnson, J.A., Ciardi, D.R., Wallace, K., Mennesson, B., von Braun, K., Vasisht, G., Prato, L., Kane, S.R., Mamajek, E.E., Walp, B., Crawford, T.J., Rougeot, R., Geneser, C.S., & Catanzarite, J. 2016, *A High-precision Near-infrared Survey for Radial Velocity Variable Low-mass Stars Using CSHELL and a Methane Gas Cell*, ApJ, 822, 40

101. Hosey, A.D., **Henry, T.J.**, Jao, W.C., Dieterich, S.B., Winters, J.G., Lurie, J.C., Riedel, A.R., & Subasavage, J.P. 2015, *The Solar Neighborhood XXXVI: The Long-term Photometric Variability of Nearby Red Dwarfs in the VRI Optical Bands*, AJ, 150, 6

100. Horch, E.P., van Altena, W.F., Demarque, P., Howell, S.B., Everett, M.E., Ciardi, D.R., Teske, J.K., **Henry, T.J.**, & Winters, J.G. 2015, *Observations of Binary Stars with the Differential Speckle Survey Instrument V: Toward an Empirical Metal-Poor Mass-Luminosity Relation*, AJ, 149, 151

99. Davison, C.L., White, R.J., **Henry, T.J.**, Riedel, A.R., Jao, W.C., Bailey, J.I., III, Quinn, S.N., Cantrell, J.R., Subasavage, J.P., & Winters, J.G. 2015, *A 3D Search for Companions to 12 Nearby M Dwarfs*, AJ, 149, 106

98. Aldoretta, E.J., Caballero-Nieves, S.M., Gies, D.R., Nelan, E.P., Wallace, D.J., Hartkopf, W.I., **Henry, T.J.**, Jao, W.C., Maiz Apellaniz, J., Mason, B.D., Moffat, A.F.J., Norris, R.P., Richardson, N.D., & Williams, S.J. 2015, *The Multiplicity of Massive Stars: A High Angular Resolution Survey With the HST Fine Guidance Sensor*, AJ, 149, 26

97. Winters, J.G., **Henry, T.J.**, Lurie, J.C., Hambly, N.C., Jao, W.C., Bartlett, J.L., Boyd, M.R., Dieterich, S.B., Finch, C.T., Hosey, A.D., Ianna, P.A., Riedel, A.R., Slatten, K.J., & Subasavage, J.P. 2015, *The Solar Neighborhood XXXV: Distances to 1404 M Dwarf Systems within 25 pc in the Southern Sky*, AJ, 149, 5

96. Finch, C.T., Zacharias, N., Subasavage, J.P., **Henry, T.J.**, & Riedel, A.R. 2014, *UCAC4 Nearby Star Survey: A Search for Our Stellar Neighbors*, AJ, 148, 119

95. Lurie, J.C., **Henry, T.J.**, Jao, W.C., Quinn, S.N., Winters, J.G., Ianna, P.A., Koerner, D.W., Riedel, A.R., & Subasavage, J.P. 2014, *The Solar Neighborhood XXXIV: A Search for Planets Orbiting Nearby M Dwarfs Using Astrometry*, AJ, 148, 91

94. Dieterich, S.B., **Henry, T.J.**, Jao, W.C., Winters, J.G., Hosey, A.D., Riedel, A.R., & Subasavage, J.P. 2014, *The Solar Neighborhood XXXII: The Hydrogen Burning Limit*, AJ, 147, 94

93. Riedel, A.R., Finch, C.T., **Henry, T.J.**, et al. 2014, *The Solar Neighborhood XXXIII: Parallax Results from the CTIOPI 0.9m Program — Trigonometric Parallaxes of Nearby Low-Mass Active and Young Systems*, AJ, 147, 85

92. Davison, C.L., White, R.J., Jao, W.C., **Henry, T.J.**, Bailey, J.I., Quinn, S.N., Cantrell, J.R., Riedel, A.R., Subasavage, J.P., Winters, J.G., & Crockett, C.J. 2014, *The Closest M Dwarf Quadruple System to the Sun*, AJ, 147, 26

91. Jao, W.C., **Henry, T.J.**, Subasavage, J.P., Winters, J.G., Gies, D.R., Riedel, A.R., & Ianna, P.A. 2014, *The Solar Neighborhood XXXI: Discovery of an Unusual Red+White Dwarf Binary at ∼25 pc via Astrometry and UV Imaging*, AJ, 147, 21

90. Mamajek, E.E., Bartlett, J.L., Seifahrt, A., **Henry, T.J.**, Dieterich, S.B., Lurie, J.C., Kenworthy, M.A., Jao, W.C., Riedel, A.R., Subasavage, J.P., Winters, J.G., Finch, C.T., Ianna, P.A., & Bean, J.L. 2013, *The Solar Neighborhood XXX: Fomalhaut C*, AJ, 146, 154

89. Cantrell, J.R., **Henry, T.J.**, & White, R.J. 2013, *The Solar Neighborhood XXIX: The Habitable Real Estate of Our Nearest Stellar Neighbors*, AJ, 146, 99

88. Metcalfe, T.S., Buccino, A.P., Brown, B.P., Mathur, S., Soderblom, D.R., **Henry, T.J.**, Mauas, P.J.D., Petrucci, R., Hall, J.C., & Basu, S. 2013, *Magnetic Activity Cycles in the Exoplanet Host Star epsilon Eridani*, ApJ, 763, 26

87. Rojas-Ayala, B., Hilton, E.J., Mann, A.W., Lepine, S., Gaidos, E., Bonfils, X., Helling, C., **Henry, T.J.**, Rogers, L.A., von Braun, K., & Youdin, A. 2013, *M Dwarfs in the Light of (Future) Exoplanet Searches*, Astron Nachr, 334, 155

86. Boyajian, T.S., von Braun, K., van Belle, G., McAlister, H.A., ten Brummelaar, T.A., Kane, S.R., Muirhead, P.S., Jones, J., White, R., Schaefer, G., Ciardi, D., **Henry, T.J.**, Lpez-Morales, M., Ridgway, S., Gies, D., Jao, W.C., Rojas-Ayala, B., Parks, J.R., Sturmann, L., Sturmann, J., Turner, N.H., Farrington, C., Goldfinger, P.J., Berger, D.H. 2012, *Stellar Diameters and Temperatures II: Main-Sequence K and M Stars*, ApJ, 757, 112

85. Dieterich, S.B., **Henry, T.J.**, Golimowski, D.A., Krist, J.E., & Tanner, A.M. 2012, *The Solar Neighborhood XXVIII: The Multiplicity Fraction of Nearby Stars from 5 to 70 AU and the Brown Dwarf Desert Around M Dwarfs*, AJ, 144, 64

84. Finch, C.T., Zacharias, N., Boyd, M.R., **Henry, T.J.**, & Hambly, N.C. 2012, *UCAC3 Proper Motion Survey II: Discovery of New Proper Motion Stars in UCAC3 with 0.40″/yr > μ ≥ 0.18″/yr between Declinations −47° and 00°*, ApJ, 745, 118

83. Boyd, M.R., **Henry, T.J.**, Jao, W.C., Subasavage, J.P. & Hambly, N.C. 2011, *The Solar Neighborhood XXVII: Discovery of New Proper Motion Stars with μ ≥ 0.18″/yr in the Southern Sky with 16.5 < R_{59F} ≤ 18.0*, AJ, 142, 92

82. Riedel, A.R., Murphy, S.J., **Henry, T.J.**, Melis, C., Jao, W.C., & Subasavage, J.P. 2011, *The Solar Neighborhood XXVI: AP Col — the Closest (8.4 pc) Pre-main-sequence Star*, AJ, 142, 104

81. Boyd, M.R., Winters, J.G., **Henry, T.J.**, Jao, W.C., Finch, C.T., Subasavage, J.P. & Hambly, N.C. 2011, *The Solar Neighborhood XXV: Discovery of New Proper Motion Stars with 0.40″/yr > μ ≥ 0.18″/yr between Declinations −47° and 00°*, AJ, 142, 10

80. Jao, W.C., **Henry, T.J.**, Subasavage, J.P., Winters, J.G., Riedel, A.R., & Ianna, P.A. 2011, *The Solar Neighborhood XXIV: Parallax Results from the CTIOPI 0.9m Program — Stars with μ ≥ 1.0″/yr (MOTION Sample) and Subdwarfs*, AJ, 141, 117

79. von Braun, K., Boyajian, T.S., Kane, S.R., van Belle, G.T., Ciardi, D.R., Lopez-Morales, M., McAlister, H.A., **Henry, T.J.**, Jao, W.C., Riedel, A.R., Subasavage, J.P., Schaefer, G., ten Brummelaar, T.A., Ridgway, S., Sturmann, L., Sturmann, J., Mazingue, J., Turner, N.H., Farrington, C., Goldfinger, P.J., & Boden, A.F. 2011, *Astrophysical Parameters and Habitable Zone of the Exoplanet Hosting Star GJ 581*, ApJ, 729, 26

78. Winters, J.G., **Henry, T.J.**, Jao, W.C., Subasavage, J.P., Finch, C.T., & Hambly, N.C. 2011, *The Solar Neighborhood XXIII: CCD Photometric Distance Estimates of SCR Targets — 77 M Dwarf Systems within 25 pc*, AJ, 141, 21

77. Metcalfe, T.S., Basu, S., **Henry, T.J.**, Soderblom, D.R., Judge, P.G., Knolker, M., Mathur, S., & Rempel, M. 2010, *Discovery of a 1.6 Year Magnetic Activity Cycle in the Exoplanet Host Star ι Hologii*, ApJ, 723, 213

76. Raghavan, D., McAlister, H.A., **Henry, T.J.**, Latham, D.W., Marcy, G.W., Mason, B.D., Gies, D.R., White, R.J., & ten Brummelaar, T.A. 2010, *A Survey of Stellar Families: Multiplicity of Solar-type Stars*, ApJSupp, 190, 1

75. Riedel, A.R., Subasavage, J.P., Finch, C.T., Jao, W.C., **Henry, T.J.**, Winters, J.G., Brown, M.A., Ianna, P.A., Costa, E., & Mendez, R.A. 2010, *The Solar Neighborhood XXII: Parallax Results from the CTIOPI 0.9m Program — Trigonometric Parallaxes of 64 Nearby Systems with 0.5″/yr < μ < 1.0″/yr (SLOWMO Sample)*, AJ, 140, 897

74. Finch, C.T., Zacharias, N., **Henry, T.J.** 2010, *UCAC3 Proper Motion Survey I: Discov-*

ery of New Proper Motion Stars in UCAC3 with 0.40″/yr > μ ≥ 0.18″/yr between Declinations −90° and −47°, AJ, 140, 844

73. Bean, J.L., Seifahrt, A., Hartman, H., Nilsson, H., Wiedemann, G., Reiners, A., Dreizler, S., & **Henry, T.J.** 2010, *The CRIRES Search for Planets Around the Lowest-mass Stars I: High-precision Near-infrared Radial Velocities with an Ammonia Gas Cell*, ApJ, 713, 410

72. Richardson, N.D., Gies, D.R., **Henry, T.J.**, Fernandez-Lajus, E., & Okazaki, A.T. 2010, *The Hα Variations of η Carinae During the 2009.0 Spectroscopic Event*, AJ, 139, 1534

71. Bean, J.L., Seifahrt, A., Hartman, H., Nilsson, H., Reiners, A., Dreizler, S., **Henry, T.J.**, & Wiedemann, G. 2010, *The Proposed Giant Planet Orbiting VB 10 Does Not Exist*, ApJ, 711, 19

70. Subasavage, J.P., Jao, W.C., **Henry, T.J.**, Bergeron, P., Dufour, P., Ianna, P.A., Costa, E., & Mendez, R.A. 2009, *The Solar Neighborhood XXI: Parallax Results from the CTIOPI 0.9m Program — 20 New Members of the 25 Parsec White Dwarf Sample*, AJ, 137, 4547

69. Jao, W.C., Mason, B.D., Hartkopf, W.I., **Henry, T.J.**, & Ramos, S.N. 2009, *Cool Subdwarf Investigations II: Multiplicity*, AJ, 137, 3800

68. Mason, B.D., Hartkopf, W.I., Gies, D.R., **Henry, T.J.**, & Helsel, J.W. 2009, *The High Angular Resolution Multiplicity of Massive Stars*, AJ, 137, 3358

67. Covey, K.R., Hawley, S.L., Bochanski, J.J., West, A.A., Reid, I.N., Golimowski, D.A., Davenport, J.R.A., **Henry, T.J.**, Uomoto, A., & Holtzman, J.A. 2008, *The Luminosity and Mass Functions of Low-Mass Stars in the Galactic Disk. I. The Calibration Region*, AJ, 136, 1778

66. Subasavage, J.P., **Henry, T.J.**, Bergeron, P., Dufour, P., & Hambly, N.C. 2008, *The Solar Neighborhood XX: Discovery and Characterization of 21 New Nearby White Dwarf Systems*, AJ, 136, 899

65. Boyajian, T.S., McAlister, H.A., Baines, E.K., Gies, D.R., **Henry, T.J.**, Jao, W.C., O'Brien, D., Raghavan, D., Touhami, Y., ten Brummelaar, T.A., Farrington, C., Goldfinger, P.J., Sturmann, L., Sturmann, J., Turner, N.H., & Ridgway, S. 2008, *Angular Diameters of the G Subdwarf μ Cassiopeiae A and the K Dwarfs σ Draconis and HR 511 from Interferometric Measurements with the CHARA Array*, ApJ, 683, 424

64. Jao, W.C., **Henry, T.J.**, Beaulieu, T.D., & Subasavage, J.P. 2008, *Cool Subdwarf Investigations. I. New Thoughts on the Spectral Types of K and M Subdwarfs*, AJ, 136, 840

63. Williams, S.J., Gies, D.R., **Henry, T.J.**, Orosz, J.A., McSwain, M.V., Hillwig, T.C., Penny, L.R., Sonneborn, G., Iping, R., van der Hucht, K.A., & Kaper, L. 2008, *Dynamical Masses for the Large Magellanic Cloud Massive Binary System [L72] LH 54-425*, ApJ, 682, 492

62. Unwin, S.C., Shao, M., Tanner, A.M., Allen, R.J., Beichman, C.A., Boboltz, D., Catan-

zarite, J.H., Chaboyer, B.C., Ciardi, D.R., Edberg, S.J., Fey, A.L., Fischer, D.A., Gelino, C.R., Gould, A.P., Grillmair, C., **Henry, T.J.**, Johnston, K.V., Johnston, K.J., Jones, D.L., Kulkarni, S.R., Law, N.M., Majewski, S.R., Makarov, V.V., Marcy, G.W., Meier, D.L., Olling, R.P., Pan, X., Patterson, R.J., Pitesky, J.E., Quirrenbach, A., Shaklan, S.B., Shaya, E.J., Strigari, L.E., Tomsick, J.A., Wehrle, A.E., & Worthey, G. 2008, *Taking the Measure of the Universe: Precision Astrometry with SIM PlanetQuest*, PASP, 120, 38

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3. Willman, B., Bochanski, J.J., Bullock, J.S., de Jong, R., Debattista, V.P., Finkbeiner, D., Grillmair, C.J., **Henry, T.J.**, Johnston, K.V., Juric, M., Kalirai, J., McGehee, P.M., Roskar, R., Sarajedini, A., Simon, J.D., Strader, J., & Strauss, M.A. 2009, *Milky Way and Local Volume Structure* in The LSST Science Book, p 203-245

2. **Henry, T.J.**, Gies, D.R., Jao, W.C., Riedel, A.R., Subasavage, J.P., Benedict, G.F., Harris, H.C., Ianna, P.A., Thorstensen, J.R., Beichman, C., Prato, L., & Simon, M. 2009, *Stellar Maps with SIM Lite* in NASA's SIM Lite Astrometric Observatory, p. 83-96

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Invited Talks and Articles

29. **Henry, T.J.** 2013, Invited Talk (222nd Meeting of the American Astronomical Society, Indianapolis, IN): *Exploration of the Solar Neighborhood in a Dynamic Way (20-20 Talk)*

28. **Henry, T.J.** 2012, Invited Talk (Cool Stars 17 Meeting, Barcelona, Spain): *The Solar Neighborhood: Who Are the Stars? Where Are the Planets?*

27. **Henry, T.J.** 2011, Invited Talk (218th Meeting of the American Astronomical Society, Boston, MA): *The SMARTS Way to Build a Map to the Stars*

26. **Henry, T.J.** 2010, Invited Plenary Talk (Georgia Regional Astronomy Meeting, Atlanta, GA): *Grab Your Map to the Stars: A Tour of the Sun's Neighborhood*

25. Bean, J., Seifahrt, A., Hartman, H., Nilsson, H., Wiedemann, G., Reiners, A., Dreizler, S., & **Henry, T.J.** 2010, Invited Article: *The CRIRES Search for Planets at the Bottom of the Main Sequence*, Messenger, 140, 41

24. **Henry, T.J.** 2009, Invited Talk (76th Annual Meeting of the Southeastern Section of the American Physical Society, Atlanta, GA): *Surveying the Neighborhood of the Sun*

23. **Henry, T.J.** 2009, Invited Talk (214th Meeting of the American Astronomical Society, Pasadena, CA): *Ground-Based Astrometry: Narrow-Angle Science Now and in the Future*

22. Cantrell, J.R. & **Henry, T.J.** 2008, Invited Article: *The Solar Neighborhood: Habitable Real Estate Around Nearby Stars*, NOAO Newsletter, 93, 3

21. **Henry, T.J.** 2008, Invited Talk (Cool Stars 15, St. Andrews, Scotland): *Low Mass Companions via Astrometry*

20. **Henry, T.J.** 2008, Invited Talk (211th Meeting of the American Astronomical Society, Austin, TX): *Stellar Results with the Space Interferometry Mission*

19. **Henry, T.J.** 2006, Invited Talk (IAU Symposium 240, Prague, Czech Republic) and Paper: *The Sun's Smaller Cousins Are Running the Universe — The Masses of Red and Brown Dwarfs*, Proceedings of IAU Symposium 240, 299

18. **Henry, T.J.** 2006, Invited Talk (207th Meeting of the American Astronomical Society, Washington, DC): *Red Targets for Radial Velocity Searches, session on The Development of the UK Precision Radial Velocity Spectrometer*

17. **Henry, T.J.** 2005, Invited Talk (SETI Institute, Moffett Field, CA): *710,000 M Dwarfs in the 'Hood*

16. **Henry, T.J.** 2005, Invited Article: *The Sun's New Neighbors*, NOAO Newsletter, 82, 7

15. **Henry, T.J.**, Jao, W.C., Subasavage, J.P., Ianna, P.A., Costa, E., & Mendez, R.A. 2005, Invited Talk (Flagstaff, AZ) and Paper: *Results from CTIOPI: Parallaxes, Perturbations, and Pushing Towards SIM PlanetQuest* in Astrometry in the Age of the Next Generation of Large Telescopes, eds. P.K. Seidelmann & A.K.B. Monet, ASP Conference Series, 338, 228

14. **Henry, T.J.** 2005, Invited Talk (205th Meeting of the American Astronomical Society, San Diego, CA): *Precision Stellar Astrophysics with SIM PlanetQuest*

13. **Henry, T.J.** 2005, Invited Talk (205th Meeting of the American Astronomical Society, San Diego, CA): *New Nearby Stars from NOAO and SMARTS Observations*

12. **Henry, T.J.** 2004, Invited Plenary Talk (203rd Meeting of the American Astronomical Society, Atlanta, GA): *RECONS is Spying on Your Neighbors*

11. **Henry, T.J.** 2004, Invited Talk (Dubrovnik, Croatia) and Paper: *The Mass-Luminosity Relation from End to End* in Spectroscopically and Spatially Resolving the Components of Close Binary Stars, eds. R.W. Hilditch, H. Hensberge, & K. Pavlovski, ASP Conference Series, 318, 159

10. **Henry, T.J.** 2002, Invited Talk (Royal Observatory Edinburgh, Scotland): *Galactic Survey Astronomy in the 1.0 to 2.5 Micron Region*

9. **Henry, T.J.** 1999, Invited Talk/Conference Summary, (NASA Ames Research Center, Moffett Field, CA) and Paper: *The 1999 Nearby Stars Marathon* in Nearby Stars (NStars) Workshop, eds. D.E. Backman, S.J. Burg, & T.J. Henry, p. 343

8. **Henry, T.J.** 1997, Invited Talk (Puerto de la Cruz, Tenerife, Canary Islands) and Paper: *Suspicious Characters Lurking in the Solar Neighborhood* in Proceedings of the Brown Dwarfs and Extrasolar Planets Conference, ed. R. Rebolo, ASP Conference Series, 134, 28

7. **Henry, T.J.** 1996, Invited Talk (Space Telescope Science Institute, Baltimore, MD): *Low Mass Companions to Nearby Stars*, Planets Beyond the Solar System and the Next Generation of Space Missions Workshop

6. **Henry, T.J.** 1995, Invited Talk (Jet Propulsion Laboratory, Pasadena, CA): *The Closest 1000 Stars*, Exploration of Neighboring Planetary Systems Kickoff Workshop

5. **Henry, T.J.** 1995, Invited Talk (Atlanta, GA): *Searching for Planets Orbiting the Nearest Stars*, Annual Meeting of the American Association for the Advancement of Science

4. **Henry, T.J.** 1995, Invited Talk (Garching, Germany) and Paper: *The Solar Neighbors in the Murky Depths of the Main Sequence* in Proceedings of the ESO Workshop on The Bottom of the Main Sequence — And Beyond, ed. C.G. Tinney, Springer-Verlag, p. 79

3. **Henry, T.J.** 1994, Invited Talk (Minneapolis, MN): *The Solar Neighbors in the Murky Depths of the Main Sequence*, 184th meeting of the American Astronomical Society

2. **Henry, T.J.** & McCarthy, Jr., D.W. 1992, Invited Talk (Pine Mountain, GA) and Paper: *The Murky Depths of the Main Sequence: Nearby Speckled Dwarfs and Elusive Brown Beasts* in Complementary Approaches to Double and Multiple Star Research, eds. H.A. McAlister & W.I. Hartkopf, ASP Conference Series, 32, 10

1. **Henry, T.J.** 1985, Invited Paper, *The Search for Extrasolar Planetary Systems* in Journal of Cornell Scientists, 2, 47

Additional Conference Proceedings

26. Plavchan, P., Gao, P., Gagne, J. et al., 2016, *Precise Near-Infrared Radial Velocities*, Proceedings of the International Astronomical Union Symposium on Young Stars and Planets Near the Sun, 314, 286

25. Subasavage, J.P., Finch, C.T., Zacharias, N., **Henry, T.J.**, & Riedel, A.R. 2015, *UCAC4 Nearby Star Survey: A Search for Our Stellar Neighbors*, Proceedings of the 18th Cambridge Workshop on Cool Stars, Stellar Systems, and the Sun, ed. G. van Belle and H.C. Harris, p. 1033

24. Davison, C.L., White, R.J., **Henry, T.J.**, & Cabrera, N. 2015, *New Projected Rotational Velocity Measurements for 65 Mid M-Dwarfs*, Proceedings of the 18th Cambridge Workshop on Cool Stars, Stellar Systems, and the Sun, ed. G. van Belle and H.C. Harris, p. 967

23. Gies, D.R., Aldoretta, E.J., Caballero-Nieves, S.M., Nelan, E.P., **Henry, T.J.**, Jao, W.C., Hartkopf, W.I., Mason, B.D., Maiz Apellaniz, J., Moffat, A.F.J., Richardson, N.D., Wallace, D.J., & Williams, S.J. 2013, *HST Fine Guidance Sensors Survey For Binaries Among The Massive Stars*, EAS Publications Series, 64, 395

22. Riedel, A.R., **Henry, T.J.**, White, R.J., Song, I., Jensen, E.L.N., & Hambly, N.C. 2012, *Nearby Motionless Stars*, Proceedings of the 16th Cambridge Workshop on Cool Stars, Stellar Systems, and the Sun, ed. C.M. Johns-Krull, M.K. Browning, & A.A. West, ASP Conference Series, 448, 1391

21. Dieterich, S.B., **Henry, T.J.**, Jao, W.C., & Riedel, A.R. 2012, *M and L Dwarf Dynamical Masses with One Adaptive Optics Observation*, Proceedings of the 16th Cambridge Workshop on Cool Stars, Stellar Systems, and the Sun, ed. C.M. Johns-Krull, M.K. Browning, & A.A. West, ASP Conference Series, 448, 849

20. Davison, C.L., White, R.J., **Henry, T.J.**, Jao, W.C., Riedel, A.R., & Cantrell, J.R. 2012, *CAESAR: Companion Assessment of Equatorial Stars with Astrometry and Radial Velocity*, Proceedings of the 16th Cambridge Workshop on Cool Stars, Stellar Systems, and the Sun, ed. C.M. Johns-Krull, M.K. Browning, & A.A. West, ASP Conference Series, 448, 825

19. Boyajian, T.S., von Braun, K., van Belle, G., ten Brummelaar, T., Ciardi, D., **Henry, T.J.**, Lopez-Morales, M., McAlister, H., Ridgway, S., Farrington, C., Goldfinger, P.J., Sturmann, L., Sturmann, J., & Turner, N. 2012, *Fundamental Properties of Cool Stars with Interferometry*, Proceedings of the 16th Cambridge Workshop on Cool Stars, Stellar Systems, and the Sun, ed. C.M. Johns-Krull, M.K. Browning, & A.A. West, ASP Conference Series, 448, 811

18. Dreizler, S., Bean, J., Seifahrt, A., Hartman, H., Nilsson, H., Wiedemann, G., Reiners, A., & **Henry, T.J.** 2010, *Pathways Towards Neptune-mass Planets around Very Low-mass Stars*, ASP Conference Series, 430, 127

17. Subasavage, J.P., Bailyn, C.D., Smith, R.C., **Henry, T.J.**, Walter, F.M., & Buxton, M.M. 2010, *SMARTS Revealed*, Proceedings of the SPIE 7737, 31

16. Metcalfe, T.S., Judge, P.G., Basu, S., **Henry, T.J.**, Soderblom, D.R., Knoelker, M., & Rempel, M. 2009, *Activity Cycles of Southern Asteroseismic Targets*, Proceedings of the Solar Analogs II Workshop

15. Subasavage, J.P., **Henry, T.J.**, Jao, W.C., Nelan, E.P., Harris, H.C. & Dahn, C.C. 2009, *Calibrating Cosmological Chronometers: White Dwarfs Masses via Astrometry*, Journal of Physics Conference Series 172, 2017

14. Jao, W.C., **Henry, T.J.**, Subasavage, J.P., Ianna, P.A., Costa, E., & Mendez, R.A. 2008, *Spying on Your Neighbors with Ultra-high Precision* in A Giant Step: from Milli- to Micro-arcsecond Astrometry, Proceedings of IAU Symposium 248, 421

13. Berger, D.H., ten Brummelaar, T.A., Gies, D.R., **Henry, T.J.**, McAlister, H.A., Merand,

A., Sturmann, J., Sturmann, L., Turner, N.H., Aufdenberg, J.P., & Ridgway, S.T. 2008, *The Radius-Luminosity Relation from Near-Infrared Interferometry: New M Dwarf Sizes from the CHARA Array*, ASP Conference Series 384, 226

12. Subasavage, J.P., **Henry, T.J.**, Bergeron, P., Dufour, P., Hambly, N.C., & Beaulieu, T.D. 2007, *Identifying and Characterizing New Nearby White Dwarfs*, PASP, 372, 53

11. Golimowski, D.G., Minniti, D., **Henry, T.J.** & Ford, H.C. 2007, *Preliminary Orbit and Masses of the Nearby Binary L Dwarf GJ 1001 BC*, Proceedings of IAU Symposium 240, 329

10. Raghavan, D., McAlister, H., **Henry, T.J.**, & Mason, B.D. 2007, *A Survey of Stellar Families: Multiplicity Among Solar-Type Stars*, Proceedings of IAU Symposium 240, 254

9. Metcalfe, T.S., **Henry, T.J.**, Knolker, M., & Soderblom, D.R. 2006, *Calibrating the Solar Dynamo: Magnetic Activity Cycles of Southern Sun-like Stars*, Proceedings of SOHO 18/GONG 2006/HELAS I, Beyond the Spherical Sun, eds. K. Fletcher & M. Thompson, published on CDROM, p. 111

8. Costa, E., Mendez, R.A., Jao, W.C., **Henry, T.J.**, & Ianna, P.A. 2006, *1.5m CTIOPI: A Southern Parallax Investigation* in XI IAU Regional Latin American Meeting of Astronomy, eds. L. Infante & M. Rubio, RMxAA Conference Series, 26, 168

7. Mendez, R.A., Costa, E., **Henry, T.J.**, Jao, W.C., & Ianna, P.A. 2006, *Trigonometric Parallaxes from the Southern Hemisphere* in Third International Meeting of Dynamical Astronomy in Latin America, eds. C. Abad, A. Bongiovanni, & Y. Guillen, RMxAA Conference Series, 25, 53

6. Jao, W.C., **Henry, T.J.**, Subasavage, J.P., & Beaulieu, T.D. 2005, *Where the Stellar Road Runners Are in the Sky* in Astrometry in the Age of the Next Generation of Large Telescopes, eds. P.K. Seidelmann & A.K.B. Monet, ASP Conference Series, 338, 268

5. Mendez, R.A., Costa, E., **Henry, T.J.**, & Ianna, P.A. 2003, *A Trigonometric Parallax Survey of the Southern Skies* in Astrometry in Latin America, ADeLA Publication Series, ed. R. Teixeira et al., 1, 1

4. Benedict, G.F., **Henry, T.J.**, McArthur, B.E., Gies, D.R., Golimowski, D.A., Ianna, P.A., Mason, B.D., Nelan, E.P., & Torres, G. 2003, *The Mass-Luminosity Relation and Space-Based Interferometry: From the Hubble Space Telescope to the Space Interferometry Mission* in Interferometry in Space, ed. M. Shao, Proceedings of the SPIE, 4852, 110

3. **Henry, T.J.**, Soderblom, D.R., Baliunas, S.L., Davis, R.J., Donahue, R.A., Latham, D.W., Stefanik, R.P., Torres, G., Duquennoy, A., Mayor, M., Andersen, J., Nordstrom, B., & Olsen, E. 1995, *The Current State of Target Selection for NASA's High Resolution Microwave Survey* in Progress in the Search for Extraterrestrial Life, ed. S. Shostak, ASP Conference Series, 74, 207

2. **Henry, T.J.** 1994, *Reconnaissance of the Nearby Stars*, Proceedings of the 8th Cambridge

Workshop on Cool Stars, Stellar Systems, and the Sun, ed. J.P. Caillault, ASP Conference Series, 64, 569

1. McCarthy, Jr., D.W., Christou, J.C., & **Henry, T.J.** 1988, *Near-Infrared Imaging of Low Mass Objects as Close Companions to Nearby Stars*, ESO Workshop Proceedings, 29, 541

Science Colloquia

37. September 2015 United States Naval Observatory, Flagstaff, AZ

36. October 2014 Yale University, New Haven, CT

35. February 2014 Georgia Institute of Technology, Atlanta, GA

34. June 2013 Illinois Wesleyan University, Bloomington, IN

33. May 2013 Las Cumbres Observatory, Santa Barbara, CA

32. November 2012 Vanderbilt University, Nashville, TN

31. November 2012 Pennsylvania State University, State College, PA

30. October 2012 University of Georgia, Athens, GA

29. September 2012 Mississippi State University, Starkville, MS

28. January 2012 Harvard-Smithsonian Center for Astrophysics, Boston, MA

27. August 2011 Las Cumbres Observatory, Santa Barbara, CA

26. September 2010 Carnegie Institution for Science, Washington, DC

25. May 2010 Lowell Observatory, Flagstaff, AZ

24. June 2009 Jet Propulsion Laboratory, Pasadena, CA

23. September 2008 Yale University, New Haven, CT

22. January 2008 Lehigh University, Bethlehem, PA

21. October 2007 Cerro Tololo Inter-american Observatory, Chile

20. October 2007 University of St. Andrews, Scotland

19. September 2007 Royal Observatory of Edinburgh, Scotland

18. June 2006 Dartmouth College, Hanover, NH

17. April 2006 Yale University, New Haven, CT

16. March 2004 Swarthmore College, Swarthmore, PA

15. November 2002 Emory University, Atlanta, GA

14. March 2000 Georgia State University, Atlanta, GA

13. April 1999 University of Pennsylvania, Philadelphia, PA

12. December 1999	Johns Hopkins University, Baltimore, MD
11. November 1998	Massachusetts Institute of Technology, Cambridge, MA
10. April 1998	University of Pennsylvania, Philadelphia, PA
9. April 1998	State University of New York, Stony Brook, NY
8. March 1998	Wesleyan University, Middleton, CT
7. April 1997	Space Telescope Science Institute, Baltimore, MD
6. March 1997	Villanova University, Villanova, PA
5. March 1997	University of Massachusetts, Amherst. MA
4. April 1996	University of Virginia, Charlottesville, VA
3. March 1996	Georgia State University, Atlanta, GA
2. August 1995	Cerro Tololo Inter-American Observatory, La Serena, Chile
1. April 1995	San Francisco State University, San Francisco, CA

External Funding — Continuing

2015-2018 Received as Principal Investigator
Exploring the Nearest Stars on Solar System Scales
$243,528 from the National Science Foundation

2014-2017 Received as Principal Investigator
Stars and Not Stars: RECONS Studies the Nearby Dwarfs
$481,104 from the National Science Foundation

2014-2017 Received as Principal Investigator
Pinpointing the Characteristics of Stars and Not Stars
$67,544 from the Space Telescope Science Institute

External Funding — Concluded (since 2000)

2012-2016 Received as Co-Investigator (PI: Sergio Dieterich, GSU)
Probing Fundamental Parameters with HST/STIS Spectroscopy
$70,760 from the Space Telescope Science Institute

2015-2016 Received as Co-Investigator (PI: Wei-Chun Jao, GSU)
Monitoring the Closest Stars in K2 Fields 8 and 10
$20,000 from NASA

2012-2015 Received as Co-Investigator (PI: Linda French, IWU)
Photometric Survey of Jovian Trojans
$256,451 from the National Science Foundation

2011-2014 Received as Principal Investigator
More than 1000 Points of Light
$232,316 from the National Science Foundation

2011-2013 Received as Co-Investigator (PI: Wei-Chun Jao, GSU)
The Weight-Watchers Program for Subdwarfs
$32,468 from the Space Telescope Science Institute

2009-2013 Received as Principal Investigator
The RECONS Survey of the Solar Neighborhood
$581,591 from the National Science Foundation

2009-2011 Received as Co-Investigator (PI: Doug Gies, GSU)
Binaries at the Extremes of the H-R Diagram

\$265,995 from the Space Telescope Science Institute

2000-2010 Received as Principal Investigator
A MASSIF Effort to Determine the Stellar Mass-Luminosity Relation
\$2,488,540 from the Jet Propulsion Laboratory

2008-2010 Received as Principal Investigator
Interplanetary Stellar Parallax Investigation via Cassini
\$50,000 from NASA

2002-2010 Received as Co-Investigator (PI: David Golimowski, JHU)
Completing a Near-Infrared Search for Very Low Mass Companions
\$38,849 from the Space Telescope Science Institute

2000-2009 Received as Principal Investigator
Calibrating the MLR at the End of the Main Sequence
\$778,514 from the Space Telescope Science Institute

2005-2009 Received as Principal Investigator
The RECONS Investigation of the Solar Neighborhood
\$522,966 from the National Science Foundation

2006-2008 Received as Co-Investigator (PI: Wei-Chun Jao, GSU)
The Weight-Watchers Program for Subdwarfs
\$81,860 from the Space Telescope Science Institute

2006-2008 Received as Co-Investigator (PI: John Subasavage, GSU)
Calibrating Cosmological Chronometers: White Dwarf Masses
\$134,560 from the Space Telescope Science Institute

2003-2005 Received as Principal Investigator
Support of CTIO 0.9m Telescope Under SMARTS
\$54,000 from Yale University

2002-2003 Received as Principal Investigator
The CTIOPI Effort to Discover Nearby Southern Stars
\$21,000 from the NASA Ames Research Center

2000-2002 Received as Principal Investigator
Speedy Gonzales Mass Determinations
\$72,208 from the Space Telescope Science Institute

Internal Funding from Georgia State University

2003-2017	Received as Principal Investigator *SMARTS Research at Georgia State University* $700,000 from GSU Office of Research & Sponsored Programs
2005-2009	Received as Co-Investigator (PI: Harold McAlister, GSU) *Research in the Center for High Angular Resolution Astronomy* $162,000 from GSU Office of Research & Award Administration

Professional Organization Activities

2015-present	Member, Observatory Council Association of Universities for Research in Astronomy
2014-present	Member, NOAO-South Facilities Operations Advisory Committee Association of Universities for Research in Astronomy
2014-present	Chair, AAS FAMOUS Grants Committee American Astronomical Society
2013-present	AAS Agent American Astronomical Society
2013-present	Co-Chair LSST: The Solar Neighborhood Working Group
2011-present	Co-Chair LSST: Differential Astrometry Working Group
2011-present	Member LSST: Stars, Milky Way, & Local Volume Science Collaboration
2003-present	Director / Operations Manager, CTIO 0.9m Telescope Small and Moderate Aperture Research Telescope System (SMARTS)
2002-present	GSU Representative Small and Moderate Aperture Research Telescope System (SMARTS)
1999-present	Principal Investigator Southern Hemisphere Parallax Survey (CTIOPI)
1994-present	Director RECONS (Research Consortium on Nearby Stars)
1987-present	Member American Astronomical Society
2016-2017	Member, Task Force on Society Governance American Astronomical Society
2012-2015	Councilor American Astronomical Society

2015, 2008 2005, 1999	Panel Member — Galactic Astronomy Hubble Space Telescope Time Allocation Committee, Baltimore, MD
2010	Panel Member NSF Populations, Abundances, Surveys, & Structure, Washington, DC
2009	Panel Member LSST Consortium Science Proposals, Tucson, AZ
2009	Co-Organizer of Four Special Sessions, *The Decade of Astrometry* American Astronomical Society Meeting, Pasadena, CA
2009	Lead Author of White Paper, *Ground-Based Astrometry 2010-2020* submitted to the Decadal Survey
2008	Panel Member NASA Exoplanets Panel Review, Washington, DC
2008	Organizer — Stellar Maps with NASA's Space Interferometry Mission Tiger Team Meeting to Develop Mission Goals, Atlanta, GA
2005	Panel Leader — Stellar Astrophysics SETI Institute: M Dwarf Habitable Zones, Mountain View, CA
2004	Organizer of Two Special Sessions, *Nearby Stars I and II* American Astronomical Society Meeting, Atlanta, GA
2001	Panel Member — Science NASA's FAME Assessment Review, Washington, DC
2001	Representative NOAO Users Committee, Tucson, AZ
2001	Reviewer Michelson Fellowship Program Committee
2000-2010	Science Team Member NASA's Space Interferometry Mission (SIM) Astrometric Observatory
1999-2003	Member NOAO Surveys Committee, Tucson, AZ
1999	Organizer of International Meeting Nearby Stars (NStars) Workshop, Mountain View, CA

1998-2006	Member Infrared Array Camera Guaranteed Time Observer Team
1998-2003	Project Scientist NASA/NSF NStars Project
1998	Panel Member — Companion Detection NASA Origins of Solar Systems Committee
1997	Panel Member — Extrasolar Planets NOAO Committee on Capabilities for Large Telescopes
1995-2010	Principal Investigator Hubble Space Telescope General Observer Program, Stellar Masses

Courses Taught at Georgia State University

ASTR 1010	Astronomy of the Solar System
ASTR 1020	Stellar and Galactic Astronomy
ASTR 3500	Fundamentals of Astronomy and Astrophysics
ASTR 4900	Senior Research in Physics and Astronomy
ASTR 8850	Planetary Sciences
ASTR 8900	Seminar in Astronomy
PERS 2002	Scientific Perspectives on Global Problems — Life on Other Worlds

Teaching Experience Beyond the Classroom

2001-2007	Director, GSU Summer Student Program in Astronomy Georgia State University
1999-2000	Director, RECONS Group Johns Hopkins University
1992-1997	Summer Student Program Space Telescope Science Institute
1992-1996	Director, Students' Hands On Physics (SHOP) Inner City Program Baltimore City Schools
1988-1992	Astronomy Camps for Teenagers and Adults University of Arizona
1986-1989	Undergraduate Laboratories and Student Athlete Tutoring University of Arizona

Administrative Experience at Georgia State University

2006-present	Department Tenure Committee
2002-present	Chair, SMARTS Users Committee
2001-present	Department Faculty Search Committee
2001-present	Astronomy Ph.D. Exam Qualifying Committee
2000-present	Graduate Recruitment/Admissions/Curriculum Committee
2012-2014	Director, Graduate Program in Astronomy
2012-2014	Department of Physics & Astronomy Executive Committee
2011-2012	McNair Scholars Program Advisory Board
2004-2008	Department of Physics & Astronomy Executive Committee
2002-2004	College of Arts & Sciences Executive Committee

Doctoral Dissertations Supervised

2018 (goal)	**Michele L. Silverstein** *The Sizes, Ages, and Disks of 2000 Nearby Red Dwarfs*
2017 (goal)	**Tiffany D. (Pewett) Clements** *Untangling the Effects of Age, Activity, and Metallicity of Red Dwarfs*
2017 (goal)	**Joseph P. Chatelain** *Exploring Jupiter's Greek and Trojan Asteroids*
2015	**Jennifer G. Winters** *Nearby Red Dwarfs & Their Dance Partners: Characterizing More Than 2000 Single & Multiple M Dwarfs Near the Sun*
2013	**Sergio B. Dieterich** *Characterization of the Stellar/Substellar Boundary*
2012	**Adric R. Riedel** *Hiding in Plain Sight*
2007	**John P. Subasavage** *White Dwarfs in the Solar Neighborhood*
2004	**Wei-Chun Jao** *Discovery and Characterization of the Highest Proper Motion Stars*

Masters Theses Supervised

2019 (goal)	**Daniel A. Nusdeo** *Stellar Companions to K Dwarfs on Solar System Scales*
2018 (goal)	**Leonardo A. Paredes** *K Dwarfs within 50 Parsecs of the Sun*
2016	**Michele L. Silverstein** *Circumstellar Environments of M Dwarfs in the Solar Neighborhood*
2013	**Tiffany D. Pewett** *Exploring the Centaurs of the Solar System*
2013	**Sergio B. Dieterich** *HLIMIT: Pinpointing the End of the Stellar Main Sequence*

2012 **Joseph P. Chatelain**
Photometric Study of Jupiter's Greeks and Trojans

2012 **Jennifer G. Winters**
Characterization of Nearby SuperCOSMOS-RECONS Stars

2009 **Adric R. Riedel**
Discovery of Young Stars Near the Sun

2009 **Justin R. Cantrell**
Habitable Real Estate in the Solar Neighborhood

2007 **Misty A. Brown**
Discovery of Nearby Stars with Moderate Proper Motions

2007 **Krupa Gandha**
Orbits of Ten Binaries within Ten Parsecs

2007 **Charlie T. Finch**
Discovery of Nearby Stars with Small Proper Motions

2005 **Thomas D. Beaulieu**
A Standard Spectral Sequence of Red Dwarf Stars

2005 **John P. Subasavage**
High Proper Motion Stars from SuperCOSMOS

Undergraduate Research Supervised (since 2000)

Summer 2016 **Adit Patel (GSU)**
Characterizing 6000 New Nearby Stars

Summer 2016 **Fahim Zaman (GSU)**
Photometric Effects of Close Sources in 2MASS/WISE Data

Spring 2016 **R. Andrew Sevrinsky (GSU)**
Masses of Red and Brown Dwarfs

Fall 2015 **Daniel Nusdeo (Southern Connecticut State University)**
Stellar Companions to K Dwarfs

Summer 2015 **R. Andrew Sevrinsky (GSU)**
Distances to a Large Sample of Nearby Red Dwarfs

Summer 2014 **Altonio Hosey (GSU)**
Long-Term Photometric Cycles in Red Dwarfs

Justin Rodriguez (GSU)
Photometry of Stars within 25 Parsecs

R. Andrew Sevrinsky (GSU)
Parallaxes of Stars within 50 Parsecs

Summer 2013 **Altonio Hosey (GSU)**
Stellar Variability of Southern Red Dwarfs

John Lurie (GSU)
A Search for Planets Orbiting Nearby M Dwarfs

Justin Rodriguez (GSU)
Building a Database of Stars within 25 Parsecs

Summer 2012 **Mark Boyd (GSU)**
Fine Wines: Red Dwarf-White Dwarf Binary Systems

Altonio Hosey, McNair Scholar (GSU)
Stellar Variability of Southern Red Dwarfs

John Lurie (GSU)
Astrometric Studies of Red and White Dwarfs

Summer 2011 **Mark Boyd (GSU)**
Wide Binary Stars in the Solar Neighborhood

Altonio Hosey, McNair Scholar (GSU)
How Many Red Dwarf Systems Are Known in the Southern Sky?

Summer 2010 **Mark Boyd (Georgia Institute of Technology)**
Faint Proper Motion Stars in the Southern Sky

Spring 2010 **Benjamin McCormick (GSU)**
Buidling a Database of Nearby Star Candidates

Summer 2009 **Mark Boyd (Georgia Institute of Technology)**
A Search for Proper Motion Stars in the Southern Sky

Summer 2008 **Ryan Ocean (GSU)**
Database of Stars within 10 Parsecs

Summer 2007 **Jessica Echols (GSU)**
Life Around an M Dwarf Star

Summer 2006 **Justin Cantrell (GSU)**
A Comprehensive Picture of the Habitable Zones of Nearby Stars

Stephanie Ramos (GSU)
Techniques in Communicating Science

Jennifer Winters (GSU)
Photometric Studies of Nearby Stars from SuperCOSMOS

Summer 2005 **Justin Cantrell (GSU)** in collaboration with Hektor Monteiro
Morphologies of Planetary Nebulae

Charlie Finch (GSU)
Optical Photometry for the NStars (Nearby Stars) Database

Stephanie Ramos (GSU) in collaboration with Wei-Chun Jao
Search for Subdwarfs at Distances less than 60 Parsecs

Jennifer Winters (GSU)
Revealing Hidden Binaries in Nearby Star Samples

Summer 2004 **Misty Brown (GSU)**
Discovery of New Nearby Stars in the SuperCOSMOS Database

Charlie Finch (GSU)
Proper Motion Companions to Nearby Stars

Jennifer Winters (GSU)
Evaluation of Optical and Infrared Photometric Data Quality

Fall 2003 **Francine Beaulieu (GSU)**
Audience Participation in Astronomy

Summer 2003 **Misty Brown (GSU)**
Development of an Astrometric Database for CTIOPI Observations

Charlie Finch (GSU)
Research on Optical Photometry of Nearby Stars

Jennifer Winters (GSU)
Creation of a Photometric Database of Nearby Stars

Summer 2002 **Jacob Bean (Georgia Institute of Technology)**
Astrometric Measurement of Multiple Stars in CTIOPI

Misty Brown (GSU)
The Infrared Brightness of Nearby Stars

Benjamin Moore (GSU)
Mapping the Motions of Stars in Binary Systems

Summer 2001 **Jacob Bean (Georgia Institute of Technology)**
Search for Intriguing Binaries within 25 Parsecs of the Sun

David Heidel (GSU)
Orbital Maps for Binaries Observed with the Hubble Space Telescope

Spring 2001 **Jennifer King (Georgia Institute of Technology)**
Titan's Spectrum and a Comparison to Uranus and Neptune

Popular Articles

9. **Henry, T.J.** 2017, *The Nearest Stars* in The Observer's Handbook 2017, ed. J. Edgar, The Royal Astronomical Society of Canada, p. 286-290

8. **Henry, T.J.** 2016, *The Nearest Stars* in The Observer's Handbook 2016, ed. D. Chapman, The Royal Astronomical Society of Canada, p. 286-290

7. **Henry, T.J.** 2015, *The Nearest Stars* in The Observer's Handbook 2015, ed. D. Chapman, The Royal Astronomical Society of Canada, p. 286-290

6. **Henry, T.J.** 2014, *The Nearest Stars* in The Observer's Handbook 2014, ed. D. Chapman, The Royal Astronomical Society of Canada, p. 286-290

5. **Henry, T.J.** 2013, *The Nearest Stars* in The Observer's Handbook 2013, ed. D. Chapman, The Royal Astronomical Society of Canada, p. 284-288

4. **Henry, T.J.** 2012, *The Nearest Stars* in The Observer's Handbook 2012, ed. D. Chapman, The Royal Astronomical Society of Canada, p. 288-292

3. **Henry, T.J.** 2011, *The Nearest Stars* in The Observer's Handbook 2011, ed. P. Kelly, The Royal Astronomical Society of Canada, p. 290-294

2. **Henry, T.J.** 2010, *The Nearest Stars* in The Observer's Handbook 2010, ed. P. Kelly, The Royal Astronomical Society of Canada, p. 280-284

1. **Henry, T.J.** 1996, *Brown Dwarfs Revealed — At Last!* in Sky & Telescope, April issue, p. 24

Educational/Public Outreach Paper

1. Saken, J.M. & **Henry, T.J.** 1996, *Students' Hands-On Physics (SHOP)* in Astronomy Education: Current Developments, Future Coordination, ed. J.R. Percy, (San Francisco: Astronomical Society of the Pacific), p. 272

Educational/Public Outreach Initiatives (since 1992)

2002	assisted in development of accurate stellar colors in *Are We Alone?*, a film for the Hayden Planetarium at the American Museum of Natural History, New York, NY
1999	provided list of nearby stars and their characteristics, and helped develop 3D representation for the map, *The Universe* for National Geographic Magazine

1998-present	provided table *The Nearest Stars* for astronomy textbook The Cosmic Perspective (Appendix F) by J. Bennett, M. Donahue, N. Schneider, & M. Voit
1997	assisted in creating video sequence of stars near the Sun for the television program, *Are We Alone?* produced by CineNova Productions Inc.
1997	provided table *The Nearest Stars* for astronomy textbook Voyages Through the Universe (Appendix 10) by A. Fraknoi, D. Morrison, & S. Wolff
1994	narrated film segment for the interactive project *Astronomy Village: Investigating the Universe* coordinated by S. Pompea

Educational/Public Outreach Talks (since 1992)

18. September 2011	SAIL Program Invited Speaker Georgia State University, Atlanta, GA *Always Be Thinking of New Ideas*
17. August 2011	Benjamin Dean Lecture California Academy of Sciences, San Francisco, CA *Your Map to the Stars: Exploring the Sun's Neighborhood*
16. June 2009	Fun Physics Camp Georgia State University, Atlanta, GA *Nearby Space and Other Worlds*
15. October 2007	Open Days of Scotland Royal Observatory of Edinburgh, Scotland *A Tour of the Solar Neighborhood*
14. April 2007	Senior University of Greater Atlanta Mercer University, Atlanta, GA *Georgia State University Astronomy*
13. July 2005	Michelson Summer School California Institute of Technology, Pasadena, CA *Ground-Based Parallax Programs*
12. January 2005	NSF Research/Education Discussion Panel

	American Astronomical Society Meeting, San Diego, CA *Integrating Research with Education and Public Outreach*
11. September 2001	Distinguished Speakers Series American Museum of Natural History, New York, NY *Suspicious Characters Lurking in the Solar Neighborhood*
10. August 2001	Edinburgh Astronomy and Technology Public Lecture University of Edinburgh, Scotland *Cool Neighbors Lurking in the Dark*
9. March 2001	Georgia Astronomy Club Emory University, Atlanta, GA *Who Are Your Neighbors and How Much Do They Weigh?*
8. April 1997	School of Continuing Studies Johns Hopkins University, Baltimore, MD *Targeting Nearby Stars that Might Harbor Life*
7. July 1996	Maryland State Governor's Academy Towson State University, Towson, MD *Habitat Design Project*
6. July 1995	Maryland State Governor's Academy Towson State University, Towson, MD *Habitat Design Project*
5. March 1995	Open Night at the Institute Space Telescope Science Institute, Baltimore, MD *Knock Knock on Stellar Doors: Is ET Home?*
4. July 1994	Science Writing Workshop George Washington University, Washington, DC *The Solar Neighbors in the Murky Depths of the Main Sequence*
3. August 1993	Maryland Space Grant Consortium *A Visit to the Third Planet* Johns Hopkins University, Baltimore, MD *The Greenhouse Effect*
2. April 1993	Arizona Astronomy Camp for Adults University of Arizona, Tucson, AZ *NASA Hears a Who?*
1. June 1992	Arizona Astronomy Camp for Advanced Teens

University of Arizona, Tucson, AZ
Humanity Hears a Who?

School Visits (since 2000)

4. June 2009	Cook Elementary School, 1st grade class, Atlanta, GA
3. January 2007	Galloway School, 6th grade class, Atlanta, GA
2. April 2004	Oak Knoll Elementary School, 4th grade class, Atlanta, GA
1. October 2001	Galloway School, 4th grade class, Atlanta, GA

Distance Running

1980-2016	completed 46 marathons — best time 2 hours 35 minutes
1991-2016	26-time qualifier and finisher of the Boston Marathon member of Boston Marathon Quarter Century Club
1995-2008	completed at least one marathon on all seven continents
2007	Kenya Safaricom Marathon, Masters Champion
1995	Antarctica Marathon (inaugural), Second Place
1993, 1996	Baltimore Road Runners Club, Runner of the Year

Curriculum Vitae: Stuart M. Jefferies

Employment

01/16 – present: Professor, Dept. of Physics and Astronomy, Georgia State University
01/11 – present: Principal Scientist, Hart Scientific L.L.C. (Arizona)
11/05 – 01/16: Professor, Institute for Astronomy, University of Hawaii.
02/11 – 03/12: Associate Director, Institute for Astronomy, University of Hawaii
10/01 – 10/05: Director, Maui Scientific Research Center,
Research Professor, Physics and Astronomy, Univ. of New Mexico
05/00 – 09/01: Senior Research Scientist, Maui High Performance Computing Center,
Univ. of New Mexico
11/99 – 04/00: Consultant, Windrush Research Corporation, Tucson, AZ
05/99 – 10/99: Research Professor, New Jersey Institute of Technology
03/97 – 04/99: Associate Scientist, National Solar Observatory, Tucson, AZ
09/93 – 02/97: Senior Research Scientist, Bartol Research Institute, Univ. of Delaware
12/89 – 08/93: Research Scientist, Bartol Research Institute, Univ. of Delaware
01/87 – 11/89: Research Associate, Bartol Research Institute, Univ. of Delaware
03/83 – 12/86: Postdoctoral Research Fellow, Department of Physics,
Univ. of Birmingham, England

Adjunct Positions

- Professor, Steward Observatory, Univ. of Arizona [2015 - present]
- Research Affiliate, Institute for Astronomy, Univ. of Hawaii [2016 – present]
- Associate Scientist, Dept. of Physics, Univ. of Rome Tor Vergata [2015 – present]
- Research Affiliate, Jet Propulsion Laboratory [2011 – 2013, 2015-present]
- Astronomer, Steward Observatory, Univ. of Arizona [2002 – 2012]
- Research Professor, Univ. of New Mexico [2005 – 2008]
- Research Affiliate, Institute for Astronomy, Univ. of Hawaii [2002-2005]

Research Skill Summary

Solar Physics: 34 years, Image Restoration: 25 years, Instrumentation: 21 years, Adaptive Optics: 12 years, Phase-Diversity Methods: 12 years, Hyper-spectral Imaging: 5 years, Neutron Metrology and Gamma-ray Spectroscopy (*): 3 years
Note: Have secured funding as PI or Co-I in all research fields except (*)

Experience

I. Leadership

- Associate Director, Institute for Astronomy, University of Hawaii, [2011 – 2012]
- Interim Associate Director, Institute for Astronomy, University of Hawaii [05/09-06/09 & 10/09]

- Established the University of New Mexico's Maui Scientific Research Center and was Director [2001-2005]

II. Instrumentation

- Designed and built custom instrumentation to observe solar oscillations [1983-1986, 2001- present].
- PI of the US Air Force sponsored Space Surveillance Simulator laboratory [2005-2006]
- Calibrated the thermal and epithermal neutron standard flux facilities at the British Standards Laboratory [1982]

III. Observing

- PI of four scientific expeditions to South Pole, Antarctica, to measure solar oscillations [1994/95, 2002/03, 2007/08, 2016/17]. Team member on three other expeditions in 1987/88, 1988/89, and 1990/91.
- Leader for the University of Birmingham solar group's Hawaii operations [1983 - 1986]. Team member for operations on Mt. Teidi, Canary Islands [1984] and Carnarvon, Australia [1984-85].

IV. Analysis

- Developed custom algorithms for the reduction and seismic analysis of solar data [1983 -present].
- Developed state-of-the-art, non-linear algorithms for a wide variety of image restoration, wave front sensing and spectral fitting problems. [1990 - present]
    - Innovator and pioneer of multi-frame blind deconvolution technique
    - Blind deconvolution algorithm adopted by U.S. Air Force for operational use [2005].

Research Support

See Appendix A.1

Scientific Publications

See Appendix A.2

Professional Services

- Proposal Reviewer for: Air Force Office of Scientific Research, Dutch Technology Foundation, National Science Foundation, NASA, US Civilian Research and Development Foundation
- Journal Reviewer for: Applied Optics; Astronomy and Astrophysics; Astrophysical Journal; Bulletin of the Astronomical Society of India; Cambridge University Press; Computational and Mathematical Methods in Medicine; Journal of Electronic Imaging; Journal of the Optical Society of America; Journal of Real-Time Image Processing; Monthly Notices of the Royal Astronomical Society;

Multidimensional Systems and Signal Processing; Optics and Lasers in Engineering; Optics Communications; Optics Express; Optics Letters; Physics Letters; Publications of the Astronomical Society of Japan; Science; Science China Mathematics; Scientific World Journal; Solar Physics; Space Science Reviews.

- Chairman of NSF's South Pole Users Committee [2005-2007]
- Review Panelist for NSF and NASA (Chairman, 2010)
- Member of Organizing Committee of IAU Commission 12 "Solar Radiation and Structure" [2012 – 2015]
- Editor for ISRN Astronomy and Astrophysics [2010-present]

Invited Positions

- Visiting Professor, Univ. of Rome Tor Vergata, Italy: 04/11-06/11, 07/12, 04/13
- Visiting Professor, Indian Institute of Astrophysics: 07/10
- Visiting Research Professor, Capodimonte Observatory, Naples, Italy: 09/97-10/97, 08/98, 12/00
- Visiting Research Professor, University of Rome, Italy: 10/99–11/99
- Visiting Senior Research Scientist, University of Tokyo, Japan: 9/95–10/95, 4/96–5/96, 10/96–11/96, 8/97, 3/98

Teaching

- Experimental Physics (undergraduates), Univ. of Birmingham [1983-86]
- Experimental Reactor Physics (graduates and undergraduates), Univ. of London, (1982-83)
- Physics, Westwood's Grammar School, Northleach, Glos., England [1982]

Supervisor

- Undergraduates
  - Research Experiences for Undergraduates (REU) [1989 – 98]
  - Summer Interns [2002 – present]
- Graduates
  - Masters and PhD students project experiments [1990 – present]
- Post Doctoral Fellows
  - Wolfgang Finsterle [2000-03], James Armstrong [2003-05], Douglas Hope [2004 -2008]
- Examiner for PhD theses

Education

- Ph.D. in Neutron Physics, University of London, England [1983]
  Thesis title: "Characterization of Thermal and Epithermal Neutron Spectra"
- Diploma of Imperial College, University of London, England [1983]

- B.Sc. (Honors) in Physics, University of Liverpool, England [1979]

Appendix A.1: Funding History (1993-2016)

Awards as Principal Investigator ($9.97M)

Award	Sponsor	Topic	Dates
$1,077,110	NSF	Using gravity waves to probe the solar atmosphere	2014-2018
$1,154,466	AFOSR	Twenty-four hour, horizon-to-horizon imaging with the Air Force's AEOS and STARFIRE telescopes	2014-2018
$40,000	Lockheed Martin	RASTER Support	2014
$45,000	JPL	Solar Activity and Far Side Investigation	2013-2014
$1,096,478	AFOSR	Advancing the surveillance capabilities of the Air Force's large aperture telescopes	2009 - 2013
$16,900	AFRL	Daylight Imaging	2011
$95,346	NCAR/HAO	Analysis of chromospheric time series	2010 - 2011
$79,461	NCAR/HAO	Analysis of chromospheric data from MOTH and TRACE	2009 - 2010
$138,750	Univ. New Mexico	Advanced Concepts in Space Situational Awareness'	2006 - 2007
$601,588	AFOSR	Next generation image restoration for space situational awareness	2006 - 2008
$497,930	AFOSR	Upgrade for space surveillance simulator	2005 - 2006
$134,052	Stanford	Helioseismic metrology	2005 - 2006
$60,040	AFOSR	Development of magneto-optical filters for solar observations	2005 - 2006
$98,300	AFRL	EVITA	2005
$1,548,553	NSF	Tomographic imaging of the velocity and magnetic fields in the Sun's atmosphere	2004 - 2010
$108,000	Boeing	TO 27: PCID Implementation	2004-2005
$151,900	AFRL	Advanced Imaging Algorithms	2004 -2005
$80,000	AFRL	Gemini Characterization/PCID	2004
$310,514	AFOSR	Space surveillance simulator	2003 - 2004
$430,000	Boeing	Advanced Imaging	2003 - 2005
$63,500	MHPCC/UH	Pan-Starrs support	2003
$27,491	Univ. Arizona	Flying spot study	2002-2003
$356,181	NASA	Helioseismic metrology: accurate modeling of the solar oscillation spectrum using an asymptotic description for the mode frequencies	2001 - 2004
$664,107	NSF	Mapping the sound speed structure of the sun's atmosphere	2001 - 2004
$140,000	AFRL	Projection Alignment Study	2001
$221,419	AFRL	Blind deconvolution study	2000 - 2001
$19,342	NSF	Probing the solar interior and atmosphere by oscillations	1995 - 1998
$711,566	NSF	Probing the solar interior from the geographic South Pole	1993 - 1997

Awards as Co-Principal Investigator ($3.17M)

Award	Sponsor	Topic	Dates
$565,000	GSU (internal)	Astroinformatics: The solar/stellar connection research cluster	2016-2017
$100,000	AFOSR	Consortium for adaptive optics and image processing	2006 - 2007
$2,500,000	AFOSR	Advanced concepts in ground-based imaging and space situational awareness	2001 - 2006

Awards as Co-Investigator ($2.05M)

Award	Sponsor	Topic	Dates
$331,500	AFOSR	Instrument Calibration Facility	2003 - 2004
$428,350	NSF	A new type of wave-front sensor for adaptive optics with pulsed laser beacons	2000 – 2003
$397,723	NSF/AFOSR	Astronomical applications of a computed tomography imaging spectrometer with an adaptive optics telescope	1999 – 2002
$645,940	NASA	Characterization of helioseismic mode parameters, their solar cycle variations, and their impact on inferences of solar dynamics using SOI/MDI data	1998 – 2001
$70,425	NASA	Seismic holography of solar activity	1998 – 1999
$180,000	NSF	Local acoustic diagnostics of the solar interior	1993 – 1997

Awards for Hart Scientific International Consulting LLC[1] ($1.32M)

Award	Sponsor	Topic	Dates
$400,000	AFRL	Extending DORA to Sodium laser Guide Star and Multi-Aperture Operation	2016-2018
$70,000	AFRL	Low cost large aperture optics	2014 - 2015
$750,000	Air Force	SBIR, Phase II: Daylight imaging	2012 - 2014
$100,000	Air Force	SBIR, Phase I: Daylight imaging	2011 - 2012

Awards Pending ($)

Award	Sponsor	Topic	Date

Proposals declined last five years

Award	Sponsor	Topic	Date
$1,594,646	Lockheed Martin	RASTER (Role: PI)	2016
$650,367	NASA	Monitoring the seismic variability of the solar tachocline during solar cycle 23 (Role: PI)	2016
$860,454	NSF	Development of an interdisciplinary space science exploration program at UH Manoa (Role: Co-I)	2014
$386,689	NASA	Monitoring the seismic variability of the solar tachocline during solar cycle 23 (Role: PI)	2013
$700,000	NASA	JUICE Instrument: Echoes (Role: Co-I)	2012
$400,000	AFRL	Low cost, large aperture electro-optical sensing (Role: Co-PI)	2012
$4,000,000	NASA	SAFARI Space Mission (Role: Co-I)	2011

[1] Hart Scientific International Consulting LLC is a private company

Appendix A.2: Scientific Publications

Refereed Journals (60 articles)

Applied Optics

Matson, C. L., Borelli, K., Jefferies, S. M., Hege, Beckner, C. C., E. K. and Lloyd-Hart, M. 2009, "A Fast and Optimal Multi-Frame Blind Deconvolution Algorithm for High-Resolution, Ground-Based Imaging of Space Objects", Applied Optics, 48, A75-A92

Jefferies, S. M., Lloyd-Hart, M., Hege, E. K. and Georges, J. 2002, "Sensing Wave Front Amplitude and Phase using Phase Diversity", Applied Optics, 41, 2095-2102 [34]

Astronomische Nachrichten

Harberreiter, M, Finsterle, W., and Jefferies, S. M. 2007, "On the Observation of Traveling Acoustic Waves in the Solar Atmosphere using a Magneto-Optical Filter", Astron. Nachr., 328, 211-214

Astronomy and Astrophysics

Stangalini, M., Del Moro, D., Berrilli, F. and Jefferies, S. M. 2011, "MHD wave transmission in the Sun's atmosphere", Astronomy & Astrophysics, 534, A65

Moretti, P-F., Jefferies, S. M., Armstrong, J. D., and McIntosh, S. W. 2007, "Observational Signatures of the Interaction Between Acoustic Waves and the Solar Magnetic Canopy", Astron. Astrophys., 471, 961-965

Garcia, R. A., Jefferies, S. M., Toner, C. G., and Palle, P. L. 1999, "Improving the Signal-to-Noise Ratio in Solar Oscillation Spectra", Astron. Astrophys., 346, L61-L64

Astrophysical Journal

Vorontsov, S. V. and Jefferies, S. M., 2013, "Modeling Solar Oscillation Power Spectra II: Parametric Model of p Modes Observed in Doppler Velocity", ApJ, 778, 75

Chitta, L. P., Jain, R. Kariyappa, R. and Jefferies, S. M. 2012, "Observational Evidence of the Interaction of Acoustic Waves and Small-scale Magnetic Fields", ApJ, 744, 98

Straus, Th., Fleck, B., Jefferies, S. M., Cauzzi, G., McIntosh, S. W., Reardon, K., Severino, G. and Steffen, M. 2008, "The Energy Flux of Internal gravity waves in the Sun's atmosphere", ApJ., 681, L125-L128

Jefferies, S. M., McIntosh, S. W., Armstrong, J. D., Bogdan, T. J., Cacciani, A. and Fleck, B. 2006, " Magneto-Acoustic Portals and the Basal Heating of the Solar Chromosphere", ApJ, 648, L151-L156

McIntosh, S. W. and Jefferies, S. M. 2006, "Observing the Modification of the Acoustic Cut-Off Frequency by Field Inclination Angle", Ap.J., 647, L77-L81

Vorontsov, S. V. and Jefferies, S. M. 2005, "Modeling Solar Oscillation Power Spectra: I. Adaptive Response Function for Doppler Velocity Measurements", Ap.J., 623, 1202-1214

Finsterle, W., Jefferies, S. M., Cacciani, A., Rapex, P. and McIntosh, S. W. 2004, ``Helioseismic Mapping of the Magnetic Canopy in the Solar Chromosphere", Ap.J., 613, L185-L188

Astrophysical Journal (continued)

Jefferies, S. M., Severino, G., Moretti, P.-F., Oliviero, M. and Giebink, C. 2003, ``How Well Can We Infer the Properties of the Solar Acoustic Sources?'', Ap.J., 596, L117-L120

Severino, G., Magri, M., Oliviero, M., Straus, Th., and Jefferies, S.M. 2001, "The Solar Intensity-Velocity Cross-Spectrum: a powerful diagnostic for helioseismology", Ap.J., 561, 444-449

Meunier, N. and Jefferies, S. M. 2000, "Two-Dimensional Modeling of the Solar Oscillation l-ν Power Spectrum", Ap.J., 530, 1016-1025

Oliviero, M., Severino, G., Straus, Th., Jefferies, S. M., and Appourchaux, T. 1999, "Space and Time Analysis of the Solar Photospheric Dynamics at Moderate l Values'", Ap.J., 516, L45-L48

Straus, Th., Severino, G., Deubner, F. L., Fleck, B., Jefferies, S. M., and Tarbell, T, 1999, "Observational Constraints on Models of the Solar Background Spectrum", Ap.J., 516, 939-945

Toner, C. G., Jefferies, S. M. and Toutain, T. 1999, "Increasing the Visibility of Solar Oscillations", Ap.J., 518, L127-L130

Garcia, R. A., Palle, P.L., Turck-Chieze, S., Osaki, Y., Shibahashi, Jefferies, S. M., Boumier, P., Gabriel, A. H., Grec, G., Robillot, J. M., Roca Cortes, T. and Ulrich, R. K. 1998, "High-frequency Peaks in the Power Spectrum of Solar Velocity Observations from the GOLF Experiment", Ap.J., 504, L51-L54

Jefferies, S. M., Osaki, Y., Shibahashi, H., Harvey, J. W., D'Silva, S., and Duvall, T. L. Jr. 1997, "Sounding the Sun's Chromosphere", Ap.J., 485, L49-L52

Toner, C. G., Jefferies, S. M., and Duvall, T. L. Jr. 1997, "Restoration of Long-Exposure Full-Disk Solar Intensity Images", Ap.J., 478, 817-827

D'Silva, S., Duvall, T. L. Jr., Jefferies, S. M., and Harvey, J. W. 1996, "Helioseismic Tomography", Ap.J., 471, 1030-1043

Lindsey, C., Braun, D., Jefferies, S. M., Woodard, M., Fan, Y., Gu, Y., and Redfield, S. 1996, "Doppler Acoustic Diagnostics of Subsurface Solar Magnetic Structure", Ap.J., 470, 636-646

Schrijver, C. J., Shine, R. A., Hagenaar, H. J., Hurlburt, N. E., Title, A. M., Strous, L. H., Jefferies, S. M., Jones, A. R., Harvey, J. W., and Duvall, T. L. Jr. 1996, "Dynamics of the Chromospheric Network; Mobility, Dispersal, and Diffusion Coefficients", Ap.J., 468, 921-932

Jefferies, S. M., Osaki, Y., Shibahashi, H., Duvall, T. L. Jr., Harvey, J. W., and Pomerantz, M. A. 1994, "Use of Acoustic Wave Travel Time Measurements to Probe the Near-Surface Layers of the Sun", Ap.J., 434, 795-800

Kumar, P., Fardal, M., Jefferies, S. M., Duvall, T. L. Jr., Harvey, J. W., and Pomerantz, M. A. 1994, "Limits on Coronal Reflection using High-Frequency Solar Oscillations", Ap.J., 422, L29-L32

Duvall, T. L. Jr., Jefferies, S. M., Harvey, J. W., Osaki, Y., and Pomerantz, M. A. 1993, "Asymmetries of Solar Oscillation Line Profiles", Ap.J., 410, 829-836

Jefferies, S. M., and Christou, J. C. 1993, "Restoration of Astronomical Images by Iterative Blind Deconvolution", Ap.J., 415, 862-864

Toner, C. G., and Jefferies, S. M. 1993, "Accurate Measurement of the Geometry for a Full-Disk Solar Image and Estimation of the Observational Point Spread Function", Ap.J., 415, 852-861

Astrophysical Journal (continued)

Braun, D. C., Duvall, T. L. Jr., LaBonte, B. J., Jefferies, S. M., Harvey, J. W. and Pomerantz, M. A. 1992, "Scattering of p-Modes by a Sunspot", Ap.J., 391, L113-L116

Braun, D. C., Lindsey, C. A., Fan, Y., and Jefferies, S. M. 1992, "Local Acoustic Diagnostics of the Solar Interior", Ap.J., 392, 739-745

Duvall, T. L. Jr., Harvey, J. W., Jefferies, S. M., and Pomerantz, M. A. 1991, "Measurements of High Frequency Solar Oscillation Modes", Ap.J., 373, 308-316

Jefferies, S. M., Duvall, T. L. Jr., Harvey, J. W., Osaki, Y., and Pomerantz, M. A. 1991, "Characteristics of Intermediate-Degree Solar P-Mode Line Widths", Ap.J., 377, 330-336

Anderson, E. R., Duvall, T. L. Jr., and Jefferies, S. M. 1990, "Modeling of Solar Oscillation Power Spectra", Ap.J., 364, 699-705

Elsworth Y. P., Jefferies, S. M., McLeod, C. P., New, R., Palle, P. L., van der Raay, H. B., Regulo, C., and Roca Cortes, T. 1989, "The 160m Solar Oscillations - An Artifact?", Ap.J., 338, 557-562

Astrophysics and Space Science

Moretti, P.F., Berrilli, F., Bigazzi, A., Jefferies, S. M., Murphy, N., Velli, M., Roselli, L. and di Mauro, M. P. 2010, “Future instrumentation for solar physics: a double channel MOF imager on board ASI Space Mission ADAHELI”, Ap&SS, 328, 313-318

Computing in Science and Engineering

Hege, E. K., Jefferies, S. M., and Lloyd-Hart, M.: 2003, ``Computing and Telescopes at the Frontiers of Optical Astronomy'', Computing in Science and Engineering, Vol. 5, Number 6, 42-51

Inverse Problems

Vorontsov, S. V. and Jefferies, S. M. 2016,”A new approach to blind deconvolution of astronomical images”, Inverse Problems, submitted.

Journal of Astronomical Telescopes, Instruments and Systems

Hart, M., Jefferies, S. M. and Murphy, N. 2016, “Daylight operation of a sodium laser guide star for adaptive optics wave-front sensing”, Journal of Astronomical Telescopes, Instruments and Systems, 2(4), 040501

Berrilli, F., Soffitta, P., Velli, M, Sabatini, P, Bigazzi, A., Bellanzini, R., Bellot-Rubio, L. R., Brez, A., 040501Carbone, V. Cauzzi, G., Cavallini, F., Consolini, G., Curti, F., Del Moror, D., Di Giorgio, A. M., Ermolli, I., Fabiani, S., Faurobert, M., Feller, A., Galsgaard, K., Gburek, S., Giannattasio, F., Giovannelli, L., Hirzberger, J, Jefferies, S., et al. 2015, “ADAHELI+: Exploring the fast dynamic Sun in the x-ray, optical and near-infrared”, Journal of Astronomical Telescopes, Instruments and Systems, 1(4), 044006

Journal of the Optical Society of America

Christou, J. C., Hege, E. K., Jefferies, S. M. and Cheselka, M. 1999, "Technique for Combining Incoherent Interferometric Images", J. Opt. Soc. Am A, 16, 1788 -1798

Monthly Notices of the Royal Astronomical Society

Vorontsov, S. V., Jefferies, S. M., Duvall, T. L. Jr., and Harvey, J. W. 1998, "Acoustic Interferometry of the Solar Atmosphere: P-modes with Frequencies Near the Acoustic Cutoff", Mon. Not. R. Astron. Soc., 298, 464-470

Elsworth, Y., Isaak, G. R., Jefferies, S. M., McLeod, C. P., and New, R. 1990, "Linewidth of Low Degree Acoustic Modes of the Sun", Mon. Not. R. Astron. Soc., 242, 135-140

Nature

Duvall, T. L. Jr., D'Silva, S., Jefferies, S. M., Harvey, J. W., and Schou, J. 1996, "Downflows Under Sunspots Detected by Helioseismic Tomography ", Nature, 379, 235-237

Duvall, T. L. Jr., Jefferies, S. M., Harvey, J. W., and Pomerantz, M. A. 1993, "Time-Distance Helioseismology", Nature, 362, 430-432

Jefferies, S. M., Palle, P. L., van der Raay, H. B., Regulo, C., and Roca Cortes, T. 1988, "The Frequency Stability of Solar Oscillations", Nature, 333, 646-649

Optics Express

Hope, D., Jefferies, S. M., Hart, M. and Nagy, J. 2016 “High-resolution speckle imaging through strong atmospheric turbulence”, Optics Express, 24, 12116-12129

Jefferies, S. M. and Hart, M. 2011, “Deconvolution from wave front sensing using the frozen flow hypothesis”, Optics Express, 19, 1975-1984

Vorontsov S. V., Strakhov, V. N., Jefferies S. M. and Borelli, K. J. 2011, “Deconvolution of astronomical images using SOR with adaptive relaxation”, Optics Express, 19, 13509-13524

Bardsley, J., Jefferies, S. M., Nagy, J. and Plemmons, R. 2006, “A computational method for the restoration of images with an unknown spatially-varying blur”, Optics Express, 14, 1767-1782

Jefferies, S. M., Schulze, K. J., Matson, C. L., Stoltenberg, K., and Hege, E. K. 2002, “Blind Deconvolution in Optical Diffusion Tomography”, Optics Express, 10, 46-53

Optics Letters

Hart, M., Jefferies, S. M. and Hope, D. A. 2016, “Atmospheric tomography for artificial satellite observations with a single guide star”, Optics Letters, 41, 3723-3726

Hope, D. A. and Jefferies, S. M. 2011, “Compact multi-frame blind deconvolution”, Optics Letters, 36, 867-869

Lloyd-Hart, M., Jefferies, S. M., Hege, E. K., and Angel, J. R. P. 2001, "Wave Front Sensing with Time-of-Flight Phase Diversity", Optics Letters, 26, 402-404

SIAM Journal on Scientific Computing

Chu, Q., Jefferies, S. M. and Nagy, J. D.: 2013, “Iterative wave front reconstruction for astronomical imaging”, SIAM J. on Sci. Computing, 35(5), S84–S103.

Solar Physics

Finsterle, W., Jefferies, S. M., Cacciani, A., Giebink, C., Knox, A., Rapex, P. and DiMartino, V.: 2004, "Seismology of the solar atmosphere", Solar Physics, 220, 317-331

Jefferies, S. M. and Vorontsov, S. V. 2004, "A new way to model the solar oscillation l−ν power spectrum", Solar Physics, 220, 347-359

Jefferies, S. M., and Duvall, T. L. Jr. 1991, "A Simple Method for Correcting Spatially Resolved Solar Intensity Oscillation Observations for Variations in Scattered Light", Solar Physics, 132, 215-222

Space Science Reviews

Elsworth, Y., Broomhall, A.-M., Gosain, S., Roth, M., Jefferies, S. M. and Hill, F. 2015, "The importance of long-term synoptic observations and data sets for solar physics and helioseismology", Space Science Reviews, 196, 137-166

Non-Refereed Journals, Conference Proceedings, etc. (110 articles)

2016

Jefferies, S. M., Hart, M, Hope, D. A., and Murphy, N. 2016, "Daylight Operation of a Sodium Laser Guide Star for Adaptive Optics Wave-Front Sensing," *Proceedings of the Advanced Maui Optical and Space Surveillance Technologies Conference*, held in Wailea, Maui, September 2016, Ed: S. Ryan, The Maui Economic Development Board, in press

Hart, M., Jefferies, S.M., Hope, D. A., Nagy, J. 2016, "A comprehensive approach to high-resolution daylight imaging for SSA", Proceedings of the Advanced Maui Optical and Space Surveillance Technologies Conference, held in Wailea, Maui, September 2016, Ed: S. Ryan, The Maui Economic Development Board, in press

Forte, R., Jefferies, S., Murphy, N., Del Moro, D., Giovannelli, L., Oliviero, M., Pietropaolo, E., Scardigli, S., and Berrilli, F. 2016, "The calibration pipeline for the MOTH II – Magneto Optical filters at Two Heights", in SOLAR POLARIZATION 8, a workshop in honor of Egidio Landi Degl'Innocenti September 12 – 16, 2016, Firenze, Italy

Hart, M. and Jefferies, S. M. 2016, "Daylight operation of a sodium laser guide star", Proc. SPIE 9909, Adaptive Optics Systems V, 99095N

Hart, M., Jefferies, S. M. and Hope D. 2016, "Tomographic wave-front sensing with a single guide star", Proc. SPIE 9982, Unconventional Imaging and Wavefront Sensing XII, 998207

Cauzzi, G., Shchukina, N., Kosovichev, A., Biande, M., Brandenberg, A., Chou, D.-Y., Dasso, S., Ding, M.-D., Jefferies, S. M, Krivova, N., Kuznetsov, V. D. and Moreno-Insertis, M. 2016, Transactions of the IAU, Volume 29A, pp. 278-299

2015

Hart, M., Rast, R., and Jefferies, S. "Resolved Observations of Geosynchronous Satellites from the 6.5 m MMT," *Proceedings of the Advanced Maui Optical and Space Surveillance Technologies Conference*, held in Wailea, Maui, September 2015, Ed: S. Ryan, The Maui Economic Development Board, in press

2014

Hart, M., Jefferies, S. M., Hope, D. A., Nagy, J., Durney, O., Cadona, R. and Williams, S. 2014, "Quantitative measurements of daytime near infrared sky brightness at the AEOS 3.6m telescope", *Proceedings of the Advanced Maui Optical and Space Surveillance Technologies Conference*, held in Wailea, Maui, September 2014, Ed: S. Ryan, The Maui Economic Development Board, in press

Nagy, J., Jefferies, S., Hart, M., and Hope, D. "Fast Tomographic Reconstruction of Atmospheric Turbulence from Micro-lens Imagery," *Proceedings of the Advanced Maui Optical and Space Surveillance Technologies Conference*, held in Wailea, Maui, September 2014, Ed: S. Ryan, The Maui Economic Development Board, in press

2013

Jefferies, S. M., Hope, D., Hart, M. and Nagy, J. 2013, "High-resolution imaging through strong atmospheric turbulence and over wide fields of view", *Proceedings of the Advanced Maui Optical and Space Surveillance Technologies Conference*, held in Wailea, Maui, September 2013, Ed: S. Ryan, The Maui Economic Development Board, p. 545

Jefferies, S. M., Hope, D., Hart, M. and Nagy, J. 2013, "High resolution imaging through strong atmospheric turbulence and over wide fields of view", Proc. SPIE 8890, Remote Sensing of Clouds and the Atmosphere XVIII; and Optics in Atmospheric Propagation and Adaptive Systems XVI, 88901C

Jefferies, S. M., Hope, D., Hart, M. and Nagy, J. 2013, "Imaging through atmospheric turbulence using aperture diversity and blind deconvolution", OSA topical meeting on Computational Optical Sensing and Imaging, Computational Imaging through Turbulence and Scattering Media, Cth1B.1

Hope, D. A., Hart, M. Jefferies, S. M. and Nagy, J 2013, "Robust image restoration for ground-based space surveillance", *Proceedings of the Advanced Maui Optical and Space Surveillance Technologies Conference*, held in Wailea, Maui, September 2013, Ed: S. Ryan, The Maui Economic Development Board, p. 537

2012

Hope, D. A. et al, "Numerical restoration of imagery obtained in strong turbulence," in *Computational Optical Sensing and Imaging*, OSA Technical Digest (online) (OSA, 2012), paper CTu2B.1.

2011

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Ahmad, A., Jefferies, S. M., Mac Mahon, T. D., Williams, J. G., and Ryves, T. B. 1982, "Characterization of Reactor Neutron Spectra and Measurement and Evaluation of Resonance Integrals", in *Reactor Dosimetry, Radiation Metrology Techniques, Data Bases and Standardization*, NUREG/CP-0029, U. S. Nucl. Regul. Comm. 1982, vol. 2, 745-753

Curriculum Vitae

Dr. Alexander Kozhanov

Address: Department of Physics and Astronomy, Georgia State University,
29 Peachtree Center ave., rm.408, Atlanta, GA 30303, USA
Phone: +1 (404) 413-6084
e-mail: akozhanov@gsu.edu
web page: http://www.phy-astr.gsu.edu/kozhanov

Research area: Spin dynamics in ferromagnetic nano-structures, geometrical magnetic frustration, novel magnetic materials, spintronics, condensed matter experiment; non-linear optics, spin transport in 2D materials.

Education

May 2006 **Ph.D. in physics**, Moscow State University, Russia
January 2003 **M.S. in physics**, Moscow State University, Russia

Positions held

Academic

08/2012-present Department of Physics and Astronomy, Georgia State University,
Assistant Professor
10/2010-08/2012 California NanoSystems Institute, University of California at Santa Barbara
Assistant Researcher
10/2006-10/2010 California Nano Systems Institute, University of California at Santa Barbara,
Postdoctoral scholar

Industry

2005-2006 Kontrakt, Ltd., "Solar cells" project, *Project manager*.

2002-2004 Optiva Inc., "Organic semiconductors" project. *Senior Research Engineer*.

Visiting Positions:

December 2016 – April 2017 Visiting Professor, National Research Nuclear University MEPhI, Moscow, Russia

December 2015 Visiting Professor, National Research Nuclear University MEPhI, Moscow, Russia

Research experience

10/2006-present Spin dynamics in magnetic micro- and nanostructures. Spintronic and magnonic devices. Non-linear optics, WGM resonators, nano-photonics.

10/2009-02/2011 MBE growth and characterization of magnetic, semiconductor and oxide films for spintronics and quantum computing applications.

2002-2006	Soft condensed matter. Organic semiconductors, OLED, TFT, solar cells.
2000-2006	Optical, transport and magnetic properties of narrow-gap semiconductors at low temperatures, high magnetic fields and high pressures.
1997-2000	Surface sputtering under ion bombardment: computer simulation.

Student mentoring

Graduate students*: Kasuni Nanayakkara (GSU), Bojun Zhang (GSU), Olga Kolentsova (MEPhI),*
Undergraduate Students:

2016 C. Kellogg, M. Hanberry, C. Wilson
2015 T. Fisher, J.E. Cortez, A. Lee, J.A. Bennett, M.M. Harb
2014 T. Fisher, A. Grant, S. Birt, M. M. Harb, K. Nguyen, J.E. Cortez
2013 T. Barbosa, E. Caldwell, T. Fisher, A. Grant, K. P. Lin-Diaz, A. Anferov, D. Nosegbe, O. Kolentsova.

Courses taught/developed

GSU:

General physics: 1111, 2211, 2212, Honors2211 (developed), Honors2212 (developed)
Electronics 3500
Classical Mechanics: 8010

MEPhI: Accelerated course on spintronics.
UCSB:

Semiconductor Device Processing 220A, 220B
Fundamentals of the Solid State 162B

Funding

Pending: NSF EPMD "Dynamic Magnonic Crystalls", $350K (2017-2020)
Past: SRC through UCSB "Spin Dynamics in Magnetic Heterostructures" (2013-2014), $20K

Patents and disclosures

- "Spin Transfer Torque Triad for Non-Volatile Logic Gates" A. Kozhanov, S.J. Allen, C. Palmstrøm. UC Disclosure US Patent 8,198,919 (June 2012).
- "Spin wave logic devices" A. Kozhanov, S.J. Allen, C.J. Palmstrøm, U.S. Patent application serial no. 13/033,347, filed on February 23, 2011, UC Disclosure (Aug. 2009)

Selected Publications

1. K. Nanayakkara, I.S. Vasil'evskii, A. Anferov, I.S. Eremin, O.S. Kolentsova, N.I. Kargin, and *A. Kozhanov*, "Tunable configurational anisotropy of concave triangular nanomagnets", J.Appl.Phys., 119, 233906 (2016)
2. A. Khitun and *A. Kozhanov* "Magnonic Logic Devices", **book chapter** in "Nanomagnetic and spintronic devices and phenomena for energy efficient memory and computing", Ed. J. Atulasimha, S. Bandyopadhyay, Willey, 2016.
3. S. J. Allen, A.J. Hauser, E. Mikheev, J.Y. Zhang, N.E. Moreno, J. Son, D.G. Ouellette, J. Kally, *A. Kozhanov*, L. Balents, S. Stemmer "Gaps and Pseudogaps in Perovskite Rare Earth Nickelates", Appl.Phys.Lett. Materials, in press (2015).
4. K. Nanayakkara, A.P. Jacob, and A. Kozhanov "Spin Wave scattering and interference in ferromagnetic cross" J. Appl. Phys., in press (2015).

5. I.S. Grudinin, A. Kozhanov, N. Yu "Waveguide couplers for ferroelectric optical resonators", arXiv:1404.6582v1 (2014).
6. K. Nanayakkara, A. Anferov, A.P. Jacob, S.J. Allen, and A. Kozhanov, "Cross junction spin wave logic architecture", IEEE Transactions of Magnetics, 50, 11, (2014), DOI: 10.1109/TMAG.2014.2320632.
7. L. Feigl, B.D. Schultz, S. Ohya, D.G. Ouellette, *A. Kozhanov*, C.J. Palmstrøm, "Structural and transport properties of epitaxial $PrNiO_3$ thin films grown by molecular beam epitaxy", *J.Cryst.Growth, in pres*s (2013);
8. T. Feil, *A. Kozhanov*, S.J. Allen, "Inelastic Light Scattering from Terahertz Standing Waves in a Slab Waveguide", J. Opt. Soc. Amer. B, Vol. 29, Issue 10, pp. 2834-2838 (2012);
9. *A. Kozhanov*, D. Ouellette, M. Rodwell, M.Popov,I.V. Zavislyak, D.W. Lee, S.X. Wang and S. J. Allen, "Magnetostatic Spin wave modes in Ferromagnetic Tubes", J. Appl.Phys111, 013905 (2012);
10. J. Buschbeck, J. Kawasaki, *A. Kozhanov*, and C. J. Palmstrøm, "Martensitic transformation of epitaxial Ni-Ti shape memory alloy films", *Appl. Phys.Let.* **98**, 191901 (2011);
11. P. Moetakef, J.Y. Zhang, *A. Kozhanov*, B. Jalan, R. Seshadri, S.J. Allen, and S. Stemmer, "Ferromagnetic $GdTiO_3/SrTiO_3$ heterostructures", Appl. Phys. Lett. **98**, 112110 (2011);
12. *A. Kozhanov*, D. Ouellette, M. Rodwell, D.W. Lee, S.X. Wang and S. J. Allen, "Micro-Structured Ferromagnetic Tubes for Spin Wave Excitation", J. Appl. Phys. 109, 07D333 (2011);
13. *A. Kozhanov*, D. Ouellette, M. Rodwell, D.W. Lee, S.X. Wang and S. J. Allen, "Magnetostatic Spin Wave Modes in Ferromagnetic Tube", IEEE Transactions on Magnetics, Vol.45, No.10, p.4223 (2009);
14. *A. Kozhanov*, D. Ouellette, M. Rodwell, A. P. Jacob, D. W. Lee and S. X. Wang and S. J. Allen, "Dispersion and spin wave "tunneling" in nano-structured magnetostatic spin waveguides", J. of Appl. Phys. **105**, 07D311 (2009);
15. *A. Kozhanov*, D. Ouellette, Z. Griffith, M. Rodwell, A. P. Jacob, D. W. Lee, S. X. Wang and S. J. Allen, "Dispersion in magnetostatic CoTaZr spin wave-guides", Appl. Phys. Lett. **94**, 012505 (2009);
16. A.I. Artamkin, *A.E. Kozhanov*, M. Arciszewska, W.D. Dobrowolsky, T. Story, E.I. Slyn'ko, V.E. Slyn'ko, D.R. Khokhlov, "Transport and magnetic properties of $Pb_{1-x}Mn_xTe$ doped with Cr and Mo", Acta Physica Polonica A, 106, 2 (2004);
17. A.V. Morozov, *A.E. Kozhanov*, A.I. Artamkin, E.I. Slyn'ko, V.E. Slyn'ko, W.D. Dobrowolski, T. Story, D.R. Khokhlov, "Fermi level pinning and negative magnetoresistance effect in PbTe(Mn,Cr)", Semiconductors 38, 27 (2004);
18. K. G. Kristovski, *A. E. Kozhanov*, D. E. Dolzhenko, I. I. Ivanchik, D. Watson, and D. R. Khokhlov, "Photoconductivity of Lead Telluride-Based Doped Alloys in the Submillimeter Wavelength Range.", Phys. Solid State 46, 122 (2004);
19. V. N. Samoilov, A. E. Tatur, N. A. Kovaleva and *A. E. Kozhanov*, "Contribution of the surface mechanism to sputtering of (001) Ni: molecular dynamics computer simulation studies", Nuclear Instruments and Methods in Physics Research B, 153, 1-4, (1999).

Dr. Rachel Kuzio de Naray – Curriculum Vitae

Contact Information

Department of Physics & Astronomy
Georgia State University
P.O. Box 5060
Atlanta, GA, USA 30302-5060

kuzio@astro.gsu.edu
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Tel: (404) 413-6086
Fax: (404) 413-5481

Current Position

Assistant Professor of Physics & Astronomy
Dept. of Physics & Astronomy, College of Arts & Sciences, Georgia State University

Previous Research Experience

2012-2013: Postdoctoral Fellow, Dept. of Astronomy, Case Western Reserve University

2010-2012: Research Associate, Dept. of Physics, Royal Military College of Canada

2007-2010: National Science Foundation Astronomy & Astrophysics Postdoctoral Fellow, Center for Cosmology, Dept. of Physics & Astronomy, Univ. of California, Irvine

2002-2007: Graduate Research Assistant, Dept. of Astronomy, University of Maryland

1999-2001: Undergraduate Research Assistant, Dept. of Astronomy & Astrophysics, The Pennsylvania State University

1997: Summer High School Apprenticeship Research Program (SHARP), Earth System Science Office, NASA Stennis Space Center

1996: Summer High School Apprenticeship Research Program (SHARP), Earth System Science Office, NASA Stennis Space Center

Education

PhD Astronomy, University of Maryland (2007), Advisor: Dr. Stacy S. McGaugh

MS Astronomy, University of Maryland (2003)

BS Astronomy & Astrophysics, Penn State University (2001), Schreyer Honors College, Advisors: Dr. R. Ciardullo, Dr. J. Charlton

Research Interests

- Observational cosmology
- Galaxies – kinematics and dynamics, dark matter, metallicity, abundances, formation, evolution, fundamental parameters, low surface brightness galaxies
- Optical emission line spectroscopy – integral field unit (IFU), long-slit

Professional Memberships

International Astronomical Union
American Astronomical Society
Division on Dynamical Astronomy

Grants

$	493,810	National Science Foundation Astronomy & Astrophysics Research Grants: *Collaborative Research: The Mighty MUSCEL of Low Surface Brightness Galaxies* (2016; submitted/under review)
$	100,000	Cottrell Scholars - Research Corporation for Science Advancement: *Unlocking the Mystery of Low Surface Brightness Galaxies* (2016; submitted/under review)
$	*805,015*	National Science Foundation CAREER grants: *CAREER: Revolutionizing Our Understanding of the Relationship Between Baryons & Dark Matter in Low Surface Brightness Galaxies (2016; not funded)*
$	*670,039*	National Science Foundation Astronomy & Astrophysics Research Grants: *Collaborative Research: Decoding the Puzzle of Low Surface Brightness Galaxies (2015; not funded)*
$	*1,074,231*	National Science Foundation CAREER grants: *CAREER: Low Mass Dwarf and Low Surface Brightness Disk Galaxies as Probes of Dark Matter and Galaxy Evolution (2015; not funded)*
$	20,230	GSU Student Technology Fee: *Dark Sky Observing from Downtown Atlanta* (ended)
$	*469,099*	National Science Foundation Astronomy & Astrophysics Research Grants: *Low Surface Brightness Galaxies: Probes of Dark Matter and Galaxy Evolution (2014; not funded)*
$	*350,931*	National Science Foundation Astronomy & Astrophysics Research Grants: *Low Surface Brightness Galaxies: Probes of Dark Matter and Galaxy Evolution (2013; not funded)*
$	201,000	National Science Foundation Postdoctoral Fellowship: AST-0702496 (ended)
$	47,500	Spitzer Space Telescope Cycle-7: PID-700091 (Co-I; ended)
$	16,482	National Science Foundation AAPF Symposium: AST-0849137 (ended)
$	500	Jacob K. Goldhaber Travel Grant, University of Maryland (ended)

Observing Experience

Spectroscopy:		
DensePak IFU on WIYN 3.5m	33	nights
SparsePak IFU on WIYN 3.5m	19	nights
RC Spectrograph on KPNO 4m	15	nights
DIS Spectrograph on APO 3.5m	12	half-nights
Imaging:		
Direct Imager on KPNO 2.1m	31	nights
WIRC on LCO du Pont 2.5m	5	nights
Direct Imager on CTIO 0.9m	7	nights
PRISM on Lowell 72-inch	4	nights
SPIcam on APO 3.5m	5	half-nights
ARCTIC on APO 3.5m	7	half-nights
Total Nights Observing:	138	nights

Additional Telescope Time Awarded

VIRUS-P IFU on H.J. Smith 2.7m	13	nights
RSS Fabry-Perot on SALT 11m	62+	hours
VLA	46	hours
SWIFT UVOT	12	hours
GBT	5	hours

Refereed Journal Articles

18. Peters, W. & **Kuzio de Naray, R.** *Photometric and Kinematic Models of Four Nearby Spiral Galaxies,* 2016, MNRAS, *submitted*

17. Bentz, M.C., Batiste, M., Seals, J., Garcia, K., **Kuzio de Naray, R.,** + 12 co-authors, *A Low-mass Black Hole in the Nearby Seyfert Galaxy UGC 06728,* 2016, ApJ, 831, 2

16. Young, J.E., **Kuzio de Naray, R.,** & Wang, S.X. *The Distribution of Star Formation and Metals in the Low Surface Brightness Galaxy UGC 628,* 2015, MNRAS, 452, 2973

15. Mitchell, C.J., Williams, T.B., Spekkens, K., Lee-Waddell, K., **Kuzio de Naray, R.,** & Sellwood, J.A. *The RINGS Survey I: Hα and HI Velocity Maps of Galaxy NGC 2280,* 2015, AJ, 149, 116

14. **Kuzio de Naray, R.** & McGaugh, S.S. *The Inner Dynamical Mass Across Galaxy Morphology: A Weak Scaling with Total Stellar Mass,* 2014, ApJ, 782, L12

13. **Kuzio de Naray, R.,** Arsenault, C.A., Spekkens, K., Sellwood, J.A., McDonald, M., Simon, J.D., & Teuben, P. *Searching for Non-axisymmetries in NGC 6503: A Weak End-on Bar,* 2012, MNRAS, 427, 2523

12. **Kuzio de Naray, R.** & Spekkens, K. *Do Baryons Alter the Halos of Low Surface Brightness Galaxies?,* 2011, ApJ, 741, L29

11. **Kuzio de Naray, R.** & Kaufmann, T. *Recovering cores and cusps in dark matter haloes using mock velocity field observations,* 2011, MNRAS, 414, 3617

10. Walker, M.G., McGaugh, S.S., Mateo, M., Olszewski, E., & **Kuzio de Naray, R.** *Comparing the Dark Matter Halos of Spiral, Low Surface Brightness and Dwarf Spheroidal Galaxies,* 2010, ApJ, 717, L87

9. **Kuzio de Naray, R.,** Martinez, G.D., Bullock, J.S., & Kaplinghat, M. *The Case Against Warm or Self-Interacting Dark Matter as Explanations for Cores in Low Surface Brightness Galaxies,* 2010, ApJ, 710, L161

8. **Kuzio de Naray, R.,** Zagursky, M.J., & McGaugh, S.S. *Kinematic and Photometric Evidence for a Bar in NGC 2683,* 2009, AJ, 138, 1082

7. **Kuzio de Naray, R.,** McGaugh, S.S., & Mihos, J.C. *Constraining the NFW Potential with Observations and Modeling of LSB Galaxy Velocity Fields,* 2009, ApJ, 692, 1321

6. **Kuzio de Naray, R.,** McGaugh, S.S., & de Blok, W.J.G *Mass Models for Low Surface Brightness Galaxies with High Resolution Optical Velocity Fields,* 2008, ApJ, 676, 920

5. McGaugh, S.S., de Blok, W.J.G., Schombert, J.M., **Kuzio de Naray, R.,** & Kim, J.H. *The Rotation Velocity Attributable to Dark Matter at Intermediate Radii in Disk Galaxies,* 2007, ApJ, 659, 149

4. **Kuzio de Naray, R.,** McGaugh, S.S., de Blok, W.J.G., Bosma, A. *High Resolution Optical Velocity Fields of 11 Low Surface Brightness Galaxies,* 2006, ApJS, 165, 461

3. **Kuzio de Naray, R.,** McGaugh, S.S., de Blok, W.J.G. *Oxygen Abundances and Chemical Evolution in Low Surface Brightness Galaxies,* 2004, MNRAS, 355, 887

2. Ciardullo, R., Feldmeier, J.J., Jacoby, G.H., **Kuzio de Naray, R.,** Laychak, M.B., Durrell, P.R. *Planetary Nebulae as Standard Candles. XII. Connecting the Population I and Population II Distance Scales,* 2002, ApJ, 577, 31

1. Giardino, Marco, Richard Miller, **Rachel Kuzio** & Dean Muirhead. *"Analysis of Ceramic Color by Spectral Reflectance."* American Antiquity 63(3), 1998: 477-483.

Other Publications

27. **Kuzio de Naray, R.,** Young, J. & Wang, S.X. *Kinematics of MUSCEL Galaxies*, 2017, AAS 229, 144.02

26. Peters, W. & **Kuzio de Naray, R.** *New Photometric and Kinematic Evidence for a Bar in NGC 2841*, 2017, AAS 229, 144.03

25. Young, J., **Kuzio de Naray, R.,** & Wang, S.X. *Star Formation in MUSCEL Galaxies*, 2017, AAS 229, 144.01

24. **Kuzio de Naray, R.,** Mitchell, C., Spekkens, K., Sellwood, J., & Williams, T.B. *The RINGS Survey: Optical Broadband Photometry*, 2016, AAS 227, 135.09

23. Peters, W. & **Kuzio de Naray, R.** *Searching for Non-Circular Motions in Halpha Velocity Fields*, 2016, AAS 227, 135.07

22. Young, J., **Kuzio de Naray, R.,** & Wang, S.X. *Inside-Out or Outside-In? Metallicity Gradients in Low Surface Brightness Galaxies in the MUSCEL Program,* 2016, AAS 227, 342.29

21. Mitchell, C., Williams, T.B., Spekkens, K., Lee-Waddell, K., **Kuzio de Naray, R.,** & Sellwood, J. *High-Resolution Halpha Velocity Fields of Nearby Spiral Galaxies with the Southern Africa Large Telescope*, 2016, AAS 227, 135.08

20. Weinberg, D.H., Bullock, J.S., Governato, F., **Kuzio de Naray, R.,** & Peter, A.H.G. *Cold Dark Matter: Controversies on Small Scales*, 2015, Proceedings of the National Academy of Sciences, 112, 12249

19. Williams, T.B., Sarre, P., Marshall, C., Spekkens, K., & **Kuzio de Naray, R.** *Diffuse Interstellar Band Emission in the Galaxy,* 2015, IAU General Assembly, 29, 2255619

18. Young, J., Wang, S., & **Kuzio de Naray, R.** *Burst and Quench? The Life Story of Low Surface Brightness Galaxies,* 2014 AAS 223, 453.07

17. **Kuzio de Naray, R.** & Kaufmann, T. *Observable Signatures of Cuspy and Cored Dark Matter Halos* "2011 May Symposium: Dark Matter", STScI, Baltimore, May 2011

16. **Kuzio de Naray, R.** & Kaufmann, T. *Using Mock Velocity Field Observations to Determine the Dark Matter Distribution in Dwarf Galaxies* 2010, in EAS Pub.Ser., A Universe of Dwarf Galaxies: Observations, Theories, Simulations, ed. P. Prugniel

15. **Kuzio de Naray, R.** *Looking for Cuspy Dark Matter Halos in Mock Galaxy Velocity Field Observations,* 2010 Bull. AAS(DDA), 41, 929

14. Smecker-Hane, T.A., & **Kuzio de Naray, R.** *The UCI COSMOS Astronomy & Astrophysics Program for Talented High School Students,* 2010 Bull. AAS, 42, 412

13. **Kuzio de Naray, R.** *Observational Constraints on the Dark Matter Distribution in Low Mass Dwarf Galaxies,* 2010 Bull. AAS, 42, 528

12. **Kuzio de Naray, R.** *Constraining the NFW Potential with DensePak IFU Velocity Fields and Rotation Curves of LSB Galaxies* "Unveiling the Mass: Extracting & Interpreting Galaxy Masses", Kingston, Ontario, Queen's University, June 2009

11. **Kuzio de Naray, R.,** Zagursky, M.J., & McGaugh, S.S. *Kinematic & Photometric Evidence for a Bar in NGC 2683,* 2009, Bull. AAS(DDA), 41, 902

10. **Kuzio de Naray, R.,** McGaugh, S.S., Mihos, J.C. *Constraining the NFW Potential with DensePak IFU Velocity Fields and Rotation Curves of LSB Galaxies* 2009 Bull. AAS 41, 325

9. Norman, D., Agueros, M., … **Kuzio de Naray, R.,** et al. *Research Science and Education: The NSF's Astronomy & Astrophysics Postdoctoral Fellowship,* 2009, Astro2010: The Astronomy & Astrophysics Decadal Survey, Position Papers, 41

8. **Kuzio de Naray, R.** *Constraining the NFW Potential with Integral Field Spectroscopy of LSB Galaxies,* 2008, in ASP Conf. Ser. 396, Formation & Evolution of Galaxy Disks, ed. J.G. Funes, S.J., & E.M. Corsini (San Francisco: ASP), 445

7. **Kuzio de Naray, R.,** McGaugh, S.S. *Halpha Velocity Fields of Low Surface Brightness Galaxies,* 2007, 3rd Irvine Cosmology Workshop: Astrophysical Probes of the Nature of Dark Matter

6. **Kuzio de Naray, R.** *High Resolution Optical Velocity Fields of LSB Galaxies and the Density Profiles of Dark Matter Halos,* 2006 Bull. AAS, 38, 1061

5. **Kuzio de Naray, R.,** McGaugh, S.S., de Blok, W.J.G., & Bosma, A. *Two Dimensional Velocity Fields of Low Surface Brightness Galaxies,* 2006, in AIP Conf. Ser. 848, Recent Advances in Astronomy & Astrophysics, 490

4. **Kuzio de Naray, R.,** McGaugh, S.S., de Blok, W.J.G., Bosma, A. *Two Dimensional Velocity Fields of Low Surface Brightness Galaxies,* 2006, in EAS Pub. Ser. 20, Mass Profiles & Shapes of Cosmological Structures, eds. G. Mamon, F. Combes, C. Deffayet, B. Fort, 285

3. **Kuzio de Naray, R.,** McGaugh, S.S., de Blok, W.J.G., & Bosma, A. *Density Profiles of Dark Matter Halos from Two Dimensional Velocity Fields of LSB Galaxies,* 2005, Bull. AAS, 37, 1500

2. Ciardullo, R., **Kuzio, R.E.,** Simone, A. *A Population Synthesis Code for Planetary Nebulae, 2001 Bull. AAS, 33, 1510*

1. **Kuzio, R.E.,** Ciardullo, R., Feldmeier, J.J., Jacoby, G.H. *Planetary Nebula Luminosity Function Distances to M33, NGC 2403 and NGC 3627 and a Comparison to the Cepheid Distance Scale,* 1999 Bull. AAS, 31, 1391

Science Talks

2016:

- **Invited Talk**, *Physics & Astronomy Colloquium*, Amherst College
- **Invited Talk**, *Physics Colloquium*, Kennesaw State University
- **Invited Panelist**, *Panel: The Postdoc to Faculty Transition,* The National Science Foundation Astronomy & Astrophysics Postdoctoral Fellowship Annual Symposium

2015:

- **Invited Talk**, *Savannah River Scholars Program STEMinar*, Georgia Regents University (now Augusta University)

2014:

- Contributed Talk, *1st Atlanta Astro Jamboree,* Georgia Tech
- Contributed Talk, *American Astronomical Society Meeting*, Washington D.C.

2013:

- **Invited Talk**, *Physics & Astronomy Colloquium*, University of Alabama
- **Invited Talk**, *Physics Colloquium*, Georgia Tech
- **Invited Talk**, *Self-Interacting Dark Matter Workshop*, Harvard

2012:

- **Invited Talk**, *Astronomy Colloquium*, Case Western Reserve University
- **Invited Panelist**, *Cold Dark Matter: Controversies on Small Scales*, Sackler Symposium, University of California, Irvine
- **Invited Talk**, *Astronomy & Astrophysics Colloquium*, Penn State University
- *Physics & Astronomy Colloquium*, Georgia State University
- **Invited Talk**, *Division on Dynamical Astronomy Meeting*, Mt. Hood, OR
- Contributed Talk, *American Astronomical Society Meeting*, Austin, TX

2011:

- *Cerro Tololo Inter-American Observatory Colloquium*, La Serena, Chile
- Contributed Talk, *Galaxy Formation: An International Conference*, Durham University, UK

2010:

- **Invited Talk**, *Physics Colloquium*, Royal Military College of Canada
- **Invited Talk**, *Astronomy Seminar*, Queen's University
- **Invited Talk**, *Lowell Observatory Joint Colloquium Series*, Lowell Observatory
- **Invited Talk**, *Advances in Theoretical & Observational Cosmology*, University of Maryland
- Contributed Talk, *Division on Dynamical Astronomy Meeting*, Boston, MA
- Contributed Talk, *American Astronomical Society Meeting*, Washington D.C.
- Contributed Talk, *NSF Astronomy & Astrophysics Postdoctoral Fellows Symposium,* Washington, D.C.

2009:

- **Invited Talk**, *Shedding Light on Dark Matter Workshop*, University of Maryland
- Contributed Talk, *Division on Dynamical Astronomy Meeting*, Virginia Beach, VA
- *Center for Astrophysical Sciences Research Seminar*, Johns Hopkins University
- *Carnegie Observatories Lunch Talk*, Carnegie Observatories, Pasadena, CA
- Contributed Talk, *NSF Astronomy & Astrophysics Postdoctoral Fellows Symposium,* Long Beach, CA

2008:

- *UC Irvine Astronomy Grad Seminar*, University of California, Irvine
- Contributed Talk, *NSF Astronomy & Astrophysics Postdoctoral Fellows Symposium,* Austin, TX

2007:

- **Invited Talk**, *Astrophysics Seminar*, University of California, Irvine
- Contributed Talk, *Formation & Evolution of Galaxy Disks*, Rome, Italy
- Contributed Talk, *American Astronomical Society Meeting*, Seattle, WA

2006:

- *Astrophysics Journal Club*, UCLA
- *Friday Scientific Lunch Talks,* National Optical Astronomy Observatory, Tuscon, AZ
- *UC Irvine Astronomy Grad Seminar*, University of California, Irvine
- Contributed Talk, *American Astronomical Society Meeting*, Washington D.C.

Teaching

- **Astronomy 8700: Observational Cosmology** (instructor)
  Graduate-level course for Astronomy PhD program, Georgia State University
  Standard Big Bang model of the universe with emphasis on observational evidence and constraints on cosmological parameters. Expansion history, primordial nucleosynthesis, cosmic microwave background, inflation, structure formation, dark matter and dark energy. Four lecture hours a week.

  Fall 2016: 7 students enrolled

  Spring 2015: 9 students enrolled

- **Astronomy 1000: Introduction to the Universe** (instructor)
  Undergraduate science elective, Georgia State University
  A survey of the universe, examining the historical origins of astronomy; the motions and physical properties of the Sun, Moon, and planets; the formation, evolution, and death of stars; and the structure of galaxies and the expansion of the universe. Three lecture hours a week.

  Spring 2016: 62 students enrolled
  Fall 2015: 39 students enrolled
  Fall 2014: 45 students enrolled
  Fall 2013: 149 students enrolled

- **Astronomy & Astrophysics** (instructor)
  Advanced high school students, COSMOS-UCI: California State Summer School for Mathematics and Science, University of California, Irvine
  Summer 2010
  Summer 2009
  Summer 2008

- **Astronomy 330: Solar System Astronomy** (teaching assistant)
  Undergraduate course for non-science majors, University of Maryland
  Spring 2004

- **Astronomy 100: Introduction to Astronomy** (teaching assistant)
  Undergraduate course for non-science majors, University of Maryland
  Fall 2003

- **Astronomy 101: General Astronomy Lab** (teaching assistant)
  Undergraduate lab course for non-science majors, University of Maryland
  Summer 2002

Course Development

- **Georgia State University, Astronomy PhD Program, Observational Cosmology** Developed a graduate-level cosmology course exploring the standard Big Bang model of the universe with an emphasis on observational evidence and constraints on cosmological parameters; Spring 2015

- **Georgia State University, Astronomy Undergraduate/Graduate Program, Applications in Astronomy** Developed syllabi for the new, redesigned ASTR 4000/6000 courses to emphasize data-driven problem solving, hands-on computational skills, critical thinking, and scientific writing; Fall 2016

- **University of California, Irvine, Astronomy Outreach Program**
  - Developed a lab project exploring dark matter in galaxies for high school students that addresses several California Science Content Standards; 2008-2010
  - Developed a lab project exploring dark matter in galaxies for college-level introductory astronomy classes; 2008-2010

Student Advising/Mentoring

- **Wesley Peters**, Georgia State Univ., Astronomy PhD candidate, "Measuring the Bar Pattern Speed in Low Surface Brightness Galaxies as a Test of the LCDM Galaxy Formation Model", Fall 2014 – present

- **Karen Garcia**, Georgia State Univ., Astronomy Masters candidate, "Kinematic and Photometric Modeling of Low Surface Brightness Dwarf Galaxies", Fall 2014 – present

- **Camilo Machuca**, Georgia State Univ., undergraduate, physics major with astronomy concentration, Spring/Summer 2016

- **Tasha Urbancic**, Royal Military College of Canada/Queen's University, undergraduate, physics major, Summer 2014

- **Chase Shepherd**, Georgia State Univ. undergraduate, physics major, Spring/Summer 2014

- **Anna-Marie Smith**, Georgia State Univ. undergraduate, physics major, Summer 2013

- **AstroPALs**, Georgia State Univ., Faculty advisor for the Astronomy Peer Advising Leaders program (AstroPAL) for incoming GSU Astronomy PhD graduate students, Fall 2014 – present

- **GSU PGSA** (Physics Graduate Student Association) – met with members during a "Coffee +Talk with a Faculty Member", Fall 2015

- **COSMOS-UCI** – mentored the recipient of the 2009 COSMOS Director's Scholarship given to a female, rising senior intending to major in the physical sciences ($6000); mentored 4 student winners of the INTEL Independent Research Award ($500)

- **Bunton-Waller Undergraduate Fellows and Freshmen in Science & Engineering Residents**, Penn State University, 1999-2000

Dissertation/Thesis Committee Member

- **Ben Ou-Yang**, Georgia State Univ., Astronomy PhD candidate, "Radio and Optical Properties of Active Galactic Nuclei Host Galaxies", dissertation committee member, defense date: 11/09/2016

- **Wesley Peters**, Georgia State Univ., Astronomy PhD candidate, "Measuring the Bar Pattern Speed in Low Surface Brightness Galaxies as a Test of the LCDM Galaxy Formation Model", dissertation advisor, Fall 2014 – present

- **Karen Garcia**, Georgia State Univ., Astronomy Masters candidate, "Kinematic and Photometric Modeling of Low Surface Brightness Dwarf Galaxies", thesis advisor, Fall 2014 – present

- **Emily Manne-Nicholas**, Georgia State Univ., Astronomy PhD candidate, "Toward Improving Supermassive Black Hole Mass Measurements in Active Galaxies", Prospectus committee member, presentation date: 04/19/2013

- **Crystal Pope**, Georgia State Univ., Astronomy PhD candidate, "The Structural and Dynamical Analysis of Nearby AGN using IFU Observations from Gemini-North's NIFS", Prospectus committee member, presentation date: 02/05/2016

Professional Service

- **Chair of the New Spectrograph Committee at Apache Point Observatory** – Responsible for directing the efforts of ~25 people representing 13 universities/institutions that are charged with producing a science requirements document for a new spectrograph on the APO 3.5m telescope; Set the agenda and facilitate the discussion at monthly telecons; Communicate to the entire APO users community the progress and results of the committee; Compose initial drafts of requirements documents, maintain in-progress versions of documents to capture comments from user community, write final version of science requirements document for submission to Apache Point Observatory and the Astrophysical Research Consortium Board of Governors (Summer 2015 – Fall 2016; Final Report presented to Community on September 20, 2016)

- **Division on Dynamical Astronomy Awards Review Committee** – Selected to serve on a 5-person committee charged with 1) establishing guidelines for a new DDA Early Career Prize, including but not limited to the eligibility rules and nomination process, 2) reviewing and if necessary revising the process by which the DDA Brouwer Award candidates are nominated, as well as the procedures involved in reviewing the nominations and selecting the candidate, and 3) developing a set of best practices for the procedures involved in selecting all DDA awards to ensure that the nomination slate reflects the diversity of the DDA membership, that conflicts of interest are minimized, and that the deliberation process is fair and ethical; Committee convened during Summer 2016, held several teleconferences for discussion and deliberation, and the report was edited and modified via email; Final report presented to DDA Executive Committee and the DDA community on November 3, 2016

- **Executive Committee of the American Astronomical Society Division on Dynamical Astronomy** – Attend meetings via telephone/Skype; Set enrollment fee for new members, annual dues for all members, registration fees for meetings of the Division; Report the activities of the Division to the Council of the Society through the Chair or Secretary; Have general charge of the affairs of the Division (07/2014 – 06/2016)

- **National Science Foundation Astronomy Proposal Review Panel** member (2016)

- **NASA Astronomy Proposal Review Panel** member (2015)

- **Grant Reviewer** for the Belgian Research Foundation – Flanders (Fonds Wetenschappelijk Onderzoek - Vlaanderen, FWO); 2014

- **Journal Referee** for *The Astrophysical Journal Letters*, *The Astronomical Journal, Monthly Notices of the Royal Astronomical Society,* and *Monthly Notices of the Royal Astronomical Society Letters*

- **Organizer** of the 2009 NSF Astronomy & Astrophysics Postdoctoral Fellow Symposium – a 2 day Splinter Meeting at the 2009 meeting of the American Astronomical Society

Department Service

- **GSU Department Representative/Contact Scientist on the Apache Point Observatory 3.5m Telescope Users Committee** - Serve as liaison between GSU astronomers, the APO staff and management, and other users from partner universities; Attend monthly meetings via telephone and represent interests of GSU astronomers; Solicit, compile, and submit quarterly telescope observing requests for GSU astronomers; Write and distribute a Users Manual for Remote Observing for GSU astronomers; Maintain records of observing/usage statistics for GSU observers at APO; Maintain and distribute passwords for remote APO login for GSU observers (Spring 2014 – present)

- **GSU Dept. of Physics & Astronomy Development**
  - Continued development of a plan for the GSU Urban Astronomy Center, a planetarium designed to enrich the education of ASTR 1000/1010/1020 students and training of Astronomy graduate students; Visit the planetaria at the Tellus Science Museum, Emory University, and Agnes Scott College to discuss the logistics of funding/operation/design with the site operators/directors; Meet with the College of Arts & Sciences' Dean Rosen and Senior Director of Development Hope Carter to present our vision of the planetarium and to discuss ways to secure the necessary funds to carry the project forward (Spring 2013 – present)
  - Facilitated the implementation of upgrades to the GSU HLCO observatory and 24-inch telescope for remote observing (2014, 2015)

- **GSU Physics & Astronomy Colloquium Committee** - Organize schedule of colloquium speakers, host speakers during visit (Fall 2013 – present)

- **GSU Astronomy 2CI Faculty Hiring Committee** - Review applications of prospective faculty candidates; Interview candidates in-person; Attend talks given by candidates; Attend lunches and/or dinners with candidates; Provide post-visit feedback/evaluation to hiring committee (2013 – 2015)

- **GSU Next Generation Faculty Program Proposal** - Contribute to the writing and editing of the Next Generation Faculty pre-proposal and full proposal "Mapping the Structure and Evolution of Galaxies with High Performance Computing – A Next Generation Faculty Program Proposal" for the anticipated hiring of 1 senior faculty member in Astronomy, 2 junior faculty (one Astronomy, one Computer Science), and 2 research faculty (one Astronomy, one Computer Science) (Fall 2016)

- **GSU Astronomy Graduate Student Qualifying Exam Committee** - Provide written exam questions and administer the oral examination of GSU Astronomy PhD candidates (2013 – present)

- **GSU Astronomy Graduate Student Admissions Committee** - Review and evaluate applications for admission to the astronomy graduate program; Interview candidates; Provide recommendation for or against offering admission (2013 – present)

- **GSU Astronomy PhD Program Representative** at the Undergraduate Reception of the American Astronomical Society Meeting; Meet and recruit undergraduate students interested in attending graduate school in astronomy; Advertise the Astronomy PhD Graduate Program at GSU; Answer questions about the application process and provide information on the GSU program (2014, 2016)

- **Co-organizer** of GSU Astronomy Dept. Summer Student Research Symposium (2014)

- **Co-organizer** of GSU Dept. of Physics & Astronomy Honors Celebration Ceremony (2014)

- **Create slideshow** for GSU Hard Labor Creek Observatory public open houses (2013)

- **University of California, Irvine Astrophysics Seminar Coordinator** - Invite and organize schedule of colloquium speakers; Host speakers during visit (2007, 2008, 2009)

- **Invited panelist** on "Becoming a Postdoc: What? Why? How? When?" for first year physics & astronomy graduate students, University of California, Irvine (2008)

- **University of Maryland Astronomy Journal Club Coordinator** - Organize weekly meetings/discussion of current scholarly journal articles (2002, 2003, 2004, 2005, 2006)

College and University Service

- **Faculty Advisor** for the GSU Astronomy Club; Provide guidance on Club activities and public outreach opportunities; Maintain financial oversight of Club funds (2013 – present)

- **Hiring of New Dean of the GSU College of Arts & Sciences** - Attend public interview talks/presentations by the final candidates for the position of GSU Dean of Arts & Sciences; Provide comments and feedback on each of the candidates to the College (Summer 2016)

- **College of Arts & Sciences Representative** in the GSU Spring Graduation Ceremony Faculty Parade (2013, 2014, 2016)

- ***"Equations, Merging Black Holes and Gravitational Waves"*** - Public talk sponsored by the Dept. of Physics & Astronomy at GSU by Professors Rachel Kuzio de Naray, Yohannes Abate, and Misty Bentz about the LIGO gravitational waves discovery and announcement (March 2016)

- ***"Dark Matter: MACHOs vs. WIMPs – A Debate of Truly Astronomical Proportions"*** - Public debate sponsored by the Dept. of Physics & Astronomy at GSU between Professor Todd Henry and Professor Rachel Kuzio de Naray (September 2015)

- **Georgia State University Magazine article** in Winter 2015 edition: *"MACHOs vs. WIMPs – The mystery of dark matter is a debate of astronomical proportions"* by William Inman

- **Judge for the Science Olympiad** "Sounds of Music" competition at Georgia State Univ. (Spring 2014)

Public Service/Outreach

- **Multimedia:**
  - ***National Public Radio "All Things Considered" WABE 90.1***
    Interviewed about the supermoon eclipse (September 2015)
  - ***Georgia Public Broadcasting Radio show "Two Way Street"***
    Interviewed about the Kepler space telescope's extrasolar planet discoveries and life in the Universe (January 2015)
  - ***Georgia Public Broadcasting TV show "On the Story"***
    Interviewed about Inflation and the Big Bang (April 2014)

- **Public Lectures:**
  - *"Equations, Merging Black Holes and Gravitational Waves"* – public lecture sponsored by the GSU Dept. of Physics & Astronomy (2016)
  - *"Dark Matter: MACHOs vs. WIMPs – A Debate of Truly Astronomical Proportions"* – GSU public debate (2015)
  - Charlie Elliott Astronomy Club, Mansfield, GA (2014)
  - Cleveland Museum of Natural History, *Frontiers of Astronomy Lecture Series* (2013)
  - Queen's Observatory Open House, Kingston, ON, Canada (2011)
  - Royal Astronomical Society of Canada Kingston Centre, Canada (2010)
  - University of California, Irvine Observatory Open House (2010)
  - Orange County Astronomers, Irvine, CA (2009)
  - University of Maryland Observatory Open House (2006)

- **Volunteer at Observatory Public Open Houses:**
  Share the wonders of the night sky, give tours of the telescope facilities, and answer questions about the cosmos
  - GSU Hard Labor Creek Observatory (2013 – present)
  - Royal Military College of Canada Observatory (2012)
  - University of California, Irvine, Observatory (2007, 2008, 2009, 2010)
  - University of Maryland Observatory (2006)
  - Penn State University AstroFest (2000, 2001)

- **Science Fair Judge:**
  - Irvine (California) Unified School District Science Fair (2009, 2010)
  - College Park, Maryland, elementary school (2005)

- **Public School Visits:**
  - Solar Observing at Irvine, California, elementary & high schools (2007, 2008, 2009)

- **University Events:**
  - Astronomy volunteer at "Maryland Day", University of Maryland (2002, 2003)

References

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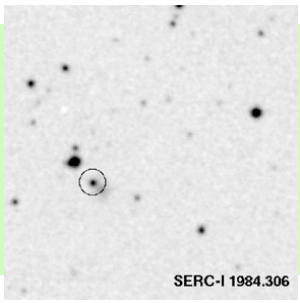
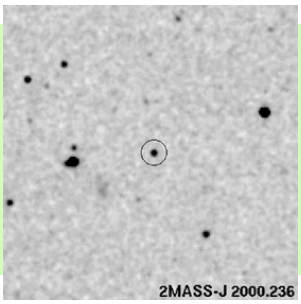
Sébastien Lépine

Ph.D. Physicist, Astronomy & Astrophysics Research Scientist





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USA

Tel: 404-413-6020
email: slepine@gsu.edu

Astrophysicist with expertise and interests in :

Data Mining
All-sky surveys (astrometric, photometric)
Science Education
Extra-solar planets
Low-mass stars and brown dwarfs
Galactic structure and evolution
Double/multiple stars
White Dwarfs

Career Experience and Appointments :

Associate Professor, Georgia State University — 2013-present :
Atlanta, GA. - Tenured associate professor in the Department of Physics and Astronomy. Teaching of undergraduate and graduate classes, supervision and mentoring of graduate students. Research programs in stellar and Galactic astrophysics.

Adjunct Professor, City University of New York (CUNY)— 2011-present :
New York, NY. - Non-remunerated, adjunct appointment with the CUNY graduate school. Supervision and mentoring of graduate students. Supervision and mentoring of undergraduate students in research projects.

Senior Research Scientist, American Museum of Natural History — 2010-2013 :
New York, NY. - Externally funded research programs in stellar and Galactic astronomy. Supervision of undergraduate interns, graduate students, and post-doctoral fellows. Mentoring activities with high school students. Consultant on the Hayden Planetarium space shows. Administration of grant-funded research and education programs.

Research Scientist, American Museum of Natural History — 2006-2010 :
New York, NY. - Externally funded research programs in stellar and Galactic astronomy. Supervision of high-school and undergraduate interns. Consultant on the Hayden Planetarium space shows.

Postdoctoral research fellow, American Museum of Natural History — 2000-2006 :
New York, NY. - Research in stellar and Galactic astronomy under the supervision of Dr. Michael M. Shara, curator.

Postdoctoral research fellow, Space Telescope Science Institute — 1998-2000
Baltimore, MD. - Development of a code to identify variable and moving objects in multiple epoch scans from the STScI Digitized Sky Surveys. Design and initial work on an all-sky proper motion survey (the SUPERBLINK survey).

Assistant professor, Saint-Laurent College — 1998
Montreal, QC. - Professor with the Physics Department. Development and teaching of a second year Physics college course on electrostatics and electromagnetism. Lectures and labs. (Saint-Laurent College is in the Quebec CEGEP network, equivalent to a U.S. community college).

Teaching assistant, University of Montreal — 1994-1997
Montreal, QC. - Responsible for 2-hour/week lectures and blackboard problem solving, plus correction of weekly homeworks. Classes taught: quantum mechanics, special relativity, classical mechanics, general astronomy for science majors.

Education :

1998: Ph.D. in Physics, University of Montreal, Montreal, Qc, Canada

1993: B.Sc. in Physics, University of Montreal, Montreal, Qc, Canada

Scholarships and awards:

1999: Academic Gold Medal of the Governor General of Canada

Annually awarded to the one student with the most distinguished record in every major Canadian University. Awarded for most outstanding student at University of Montreal (among 26,000 full-time students).

1998: First prize for best student presentation, CASCA general meeting

Awarded at the annual general meeting of the Canadian Astronomical Society.

1997-1998: Quebec-FCAR graduate student scholarship

Elite scholarship awarded by the government of Quebec for pursuing and completing doctoral studies in the natural or applied sciences.

1994-1997: Canada-NSERC graduate student scholarship

Elite scholarship awarded by the government of Canada for pursuing graduate studies in the natural sciences (equivalent to a U.S. National Science Foundation graduate fellowship).

1990-1994: Canada Ministry of Science and Industry undergraduate scholarship

Elite scholarship awarded by the government of Canada for undergraduate studies in the natural sciences.

Research Grants Awarded:

$50,000 - National Aeronautics and Space Administration (NASA), Kepler Space Telescope Grant (awarded - in processing):

(P.-I.) -. Kepler Space Telescope K2 Guest Observer - cycle 4. "Rotation rates for stars in wide binary systems and a search for hierarchical triples".

$100,000 - National Aeronautics and Space Administration (NASA), Kepler Space Telescope Grant (2016-present):

(P.-I.) -. Kepler Space Telescope K2 Guest Observer - cycle 3. "A search for exoplanets and close stellar/substellar companions in the local halo population for K2 campaigns 8 and 10".

$30,000 - National Aeronautics and Space Administration (NASA), Kepler Space Telescope Grant (2016-present):

(P.-I.) -. Kepler Space Telescope K2 Guest Observer - cycle 3. "Rotation rates for stars in wide binary systems and a search for hierarchical triples".

$100,000 - National Aeronautics and Space Administration (NASA), Kepler Space Telescope Grant (2015-present):

(P.-I.) -. Kepler Space Telescope K2 Guest Observer - cycle 1. "A search for exoplanets and close stellar/substellar companions in the local halo population".

$160,000 - National Aeronautics and Space Administration (NASA), Hubble Space Telescope Grant (2011-2014):

(P.-I.) -. Hubble Space Telescope cycle 18 AR program. "The Multiplicity Fraction and Period Distribution of Nearby Disk and Halo Stars" (Archival Research program).

$905,328 - National Aeronautics and Space Administration (NASA), Education Grant (2009-2013):

(Co-P.I.) - Science Research Mentoring Program (SRMP), development of an after-school program in astrophysics and space sciences, combined with research internships. For children from under-represented minorities / low-income families, grades 9-12.

Research Grants Awarded (continued):

$564,000 - National Science Foundation (NSF), Astrophysics Grant (2009-present):

(P.I.) - Astrophysics grant AST-0908406 : "Collaborative Research: Nearby M Stars as High-Priority Targets for Exoplanet Searches."

$16,000 - National Aeronautics and Space Administration (NASA), JPL grant (2009):

(P.I.) - NASA-Keck program: "A search for stellar/substellar companions to low-mass, halo stars.".

$45,000- National Aeronautics and Space Administration (NASA), GALEX grant (2009-2011)

(P.I.) - GALEX cycle 5 GI project. "A systematic search for nearby white dwarfs in the GALEX archive: positions and motions of 100,000 disk and halo white dwarfs".

$90,000- National Aeronautics and Space Administration (NASA), Hubble Space Telescope grant (2009-2011 / Cycle 17)

(P.I.) - Hubble Space Telescope cycle 17 GO program. "A search for astrometric companions to very low-mass, Population II stars" (70 HST orbits).

$325,000 - National Science Foundation (NSF), Astrophysics grant (2007-2009)

(P.I.) - Astrophysics grant AST-0607757 : "Positions and motions of 250,000 stars in the Solar Vicinity: stellar contents and dynamical structure of the Galaxy".

$100,000 - Kalbfleish Research Fellowship (2002-2004)

(P.I.) - For carrying out a research program in the natural sciences at the American American Museum of Natural History: "An all-sky survey of stars within 30 parsecs of the Sun"

$188,000 - National Science Foundation (NSF), Astrophysics grant (2000-2002)

(Co-P.I.) - Astrophysics grant AST-0087313 : "NSTARS: Completing the Inventory of Nearby Stars: An automated all-sky search for high proper-motion stars using the Digitized Sky Survey."

$70,000 - Canada-NSERC post-doctoral fellowship (1998-2000)

(P.I.) - Science research fellowship from the Government of Canada (Elite fellowship, highly competitive, equivalent to a U.S. National Science Foundation postdoctoral fellowship.)

Astronomical observation and research expertise:

Over 450 nights awarded on a wide variety of telescopes, including:

- *William M. Keck 10.0-meter Telescope*
- *Cerro-Tololo Inter-american Observatory (CTIO) 4.0-meter Blanco*
- *Kitt Peak National Observatory (KPNO) 3.8-meter Mayall Telescope*
- *Canada-France-Hawaii 3.6-meter Telescope (CFHT)*
- *Lick Observatory 3.0-meter Shane Telescope*
- *MDM Observatory 2.4-meter Hiltner Telescope*
- *Steward Observatory 2.3-meter Bok Telescope*
- *Kitt Peak National Observatory (KPNO) 2.1-meter Telescope*
- *Mont Megantic Observatory 1.6-meter Telescope*
- *MDM Observatory 1.3-meter McGraw-Hill*
- *Kitt Peak National Observatory (KPNO) 0.9-meter Telescope*

Complete lists of awarded programs available on request. Regular awards through competitive programs such as the National Optical Astronomical Observatories (NOAO). Programs awarded every year since 2000.

Referee for Major Scientific Journals and Publications *(2005-2016)*:

- ***The Astronomical Journal (USA):*** *acting scientific referee on **7** research manuscripts.*
- ***Astronomy and Astrophysics (European Union):*** *acting scientific referee on **11** research manuscripts.*
- ***The Astrophysical Journal (USA):*** *acting scientific referee on **16** research manuscripts.*
- ***Monthly Notices of the Royal Astronomical Society (United Kingdom):*** *acting scientific referee on **7** research manuscripts.*
- ***Nature (United Kingdom):*** *acting scientific referee on **1** research manuscript.*
- ***Research in Astronomy and Astrophysics (China):*** *acting scientific referee on **1** research manuscript.*

Panel Membership evaluating the work of others:

- ***Physics & Astronomy Scholarship and Fellowship Selection Committee*** *of the Natural Science and Engineering Council (NSERC) of Canada. (2014-present)*
- ***Panelist for the Astronomy and Astrophysics Grants (AAG) awards selection*** *for the United States National Science Foundation. (2016)*
- ***Panelist on the Telescope Allocation Committee (TAC)*** *for the NASA share of the W. M. Keck Telescopes: member of both the Stars panel, and the Exoplanets panel. (2012-2013)*
- ***Panelist on the Telescope Allocation Committee (TAC)*** *for the Hubble Space Telescope, Space Telescope Science Institute (STScI): member of the Galactic Astronomy panel. (2012)*
- ***Panelist on the Telescope Allocation Committee (TAC)*** *for the National Optical Astronomical Observatories (NOAO): member of the Galactic Astronomy panel. (2008-2010)*
- ***Panel Judge for the "Chambliss Award"*** *of the American Astronomical Society (AAS), awarding annual prizes for the best undergraduate and graduate student presentations at the annual meeting of the AAS (2008-present).*

Other Synergistic activities:

- ***Member of the working group on stellar populations*** *for the planned Large Synoptic Survey Telescope (LSST).*
- ***Member of the International Science Development Team (ISDT)*** *on "Stars and Planets" and on "Milky and nearby Galaxies" for the future Thirty-Meter Telescope (TMT).*

Teaching / supervision experience:

Administrator of the NASA-SRMP program (2009-2013):

Administrator of the Science Research and Mentoring Program (SRMP), funded by a grant from NASA. Development of a curriculum of five after-school classes (each one a 6-weeks course) for high-school students. Teaching duties on some of the classes. Also responsible for hiring and training junior scientists (grad students and post-docs) to teach the other classes. Development of an internship program pairing students with scientists for an 8-month, 4 hours/week research internship.

Internet science teacher for science educators (2010-2013):

Internet classes ("The Solar System", "Space, Time and Motion") from the National Center for Science Literacy, guidance of 15-20 on-line students per semester. Part of the "Seminars on Science" series, where most students are science educators at the high-school level. Update on current discoveries in astronomy, tips on science education methods, use of internet tools. Tips on how to convey scientific ideas. Help in developing teaching plans.

Supervision of graduate students :

- ***Bokyoung Kim (Georgia State University):*** *Ph.D. candidate, Thesis title: T.B.D.*
- ***Neda Hejazi (Georgia State University):*** *Ph.D. candidate, Thesis title: T.B.D.*
- ***Zachary Hartman (Georgia State University):*** *Ph.D. candidate, Thesis title: T.B.D.*
- ***Daniel Horenstein (Georgia State University):*** *M.S. candidate, Thesis title: T.B.D.*
- ***Dicy Ann Sailor (Georgia State University):*** *Ph.D. candidate, Thesis title: "Stellar fast rotators in the Kepler K2 observing mission."*
- ***Marie-Michèle Limoges (Université de Montréal):*** *Ph.D. candidate, Thesis title: "Physical Parameters of White Dwarfs in the Solar Neighborhood", (Co-supervision with Prof. Pierre Bergeron). Thesis successfully defended, August 2014.*
- ***Julie Skinner (Dartmouth College):*** *Ph.D. candidate, Thesis title: "A Search for Cataclysmic Variable Progenitors", (Co-supervision with Prof. John Thorstensen). Thesis successfully defended, June 2014.*
- ***Zhong Jing (Shanghai Astronomical Observatory):*** *Ph.D. candidate, (Co-supervision with Prof. Hou Jinliang). Thesis successfully defended, June 2013.*
- ***Josh Schlieder (State University of New York, Stonybrook):*** *Ph.D. candidate, Thesis title: "A Search for Young Low-Mass Stars as Members of Nearby Moving Groups", (Co-supervision with Prof. Michal Simon). Thesis successfully defended, July 2011.*

Supervision of college undergraduates :

Supervision of college undergraduates in semester-long research programs, several as part of the NSF Research Experience for Undergraduates (REU) program:

- 2003: **Drew McCourt, Maria Halmo**.
- 2004: **Bethany Bongiorno**.
- 2005: **Amanda Moffett**.
- 2007: **Elisa Corin, Marina Zaiats, Kelly Patton**.
- 2008: **Jacob Hummel, Monica Huang**.
- 2009: **Jacqueline Stone, Bryndis Cruz**.
- 2010: **Faith Pilacik, Naomi Alpert, Helga Wong, Hannah Bish.**
- 2011: **Olivia James, Matt Wilde, Anne Mennen, Daniel Dutcher.**
- 2012: **Dax Feliz, Christine O'Donnell, Christina Krawiec, Jumari Robinson, Andre Newland.**
- 2014: **Maimuna Hossain.**
- 2015: **Freddie Wilson, Natalie Harrell.**

Mentoring of high-school students :

Mentoring of high-school juniors and seniors in small, focused research programs, for participation in local/national science fairs and the "Intel Talent Search" competition:

- 2006-2007: **Christopher Jordan, Katherine Bedkowski** (Intel national semi-finalist).
- 2007-2008: **Amy Secundi.**
- 2008-2009: **Grace Guo, Philip Schmiege, Michal Yardeni.**
- 2009-2010: **Kevin Chon** (Siemens regional semi-finalist).
- 2010-2011: **Chui Yu Lau, Spencer Hamilton, Hema Lochan, Gina Kwon.**
- 2011-2012: **Jennifer Mizhquiri, Brett Barshay, Douglas Riegel, Rebecca Kaplan, Fred Lee.**
- 2012-2013: **Richard Nederlander, Ryan Adler-Levine, Lorena Mezini**

Education / public outreach :

- ***Credits: "Journey to the Stars" - A planetarium space show produced by the American Museum of Natural History (2009),*** *simulations and 3-D representation of stars in the Galaxy (positions and motions), realistic rendition of the Solar neighborhood, positions and motions of all the stars.*
- ***Science presentations to local elementary school and high school students (2010-2012),*** *various groups, through the AMNH summer school program.*
- ***Presentations and hands-on activities to local kindergarten, 3rd grade, 4th grade, and 6th grade classes in local schools with under-represented minorities (2009-2012).*** *Hands-on activities to stimulate interest in the space sciences, and teach about Earth, the Sun, and the Solar System. Over 400 children reached so far. Volunteer work. (Schools with ethnic distribution: 60% latino-americano, 25% african-american, 10% caucasian, 5% asian - Hackensack New Jersey School district).*

Invited Seminars, Colloquia, and Lectures:

- May 2016: invited speaker, annual meeting of the American Astronomical Society Division on Dynamical Astronomy (DDA), Nashville, TN.
- October 2012: Department of Physics and Astronomy, Georgia State University, Atlanta, GA
- September 2012: Department of Physics, Rensselaer Polytechnic Institute, Troy, NY
- January 2012: Department of Physics, Rochester Institute of Technology, Rochester, NY.
- November 2011: Department of Physics, Rutgers University, New Brunswick, NJ.
- November 2011: Department of Physics and Earth Science, York College, New York, NY.
- March 2011: Department of Physics and Astronomy, Villanova University, Philadelphia, PA.
- February 2011: Department of Physics, Lehmann College, New York, NY.
- February 2011: Department of Physics and Astronomy, Dartmouth College, Hanover, NH.
- November 2010: Department of Terrestrial Magnetism, Carnegie Institution of Washington, Washington, DC.
- November 2009: Département de Physique, Université de Montréal, Montréal, Canada.
- August 2009: Department of Physics & Astronomy, College of Staten Island, New York, NY.
- January 2009: Harvard-Smithsonian Center for Astrophysics, Boston, MA.
- August 2008: United States Naval Observatory, Flagstaff, AZ.
- March 2008: Department of Physics, Hofstra University, New York, NY.
- December 2007: Max Planck Institute für Astronomie, Heidelberg, Germany
- October 2007: Department of Physics, Stony Brook University, Stony Brook, NY
- February 2007: Department of Physics, Michigan State University, East Lansing, MI.
- September 2006: Department of Physics & Astronomy, Georgia State University, Atlanta, GA.
- March 2006: Sloan Digital Sky Survey Collaboration Meeting, Santa Fe, NM.
- October 2005: Department of Astronomy, Yale University, New Haven, CT.
- October 2005: Department of Physics, Massachusetts Institute of Technology, Cambridge, MA.
- January 2005: Department of Physics & Astronomy, Ohio State University, Columbia, OH.
- February 2004: Department of Physics, University of Western Ontario, London, Canada.
- May 2004: Department of Physics, New York University, New York, NY.
- January 2004: Department de Physique, Université de Montréal, Montreal, Canada.
- September 2003: Department of Physics & Astronomy, Queens University, Kingston, Canada.

List of Scientific Publications

A) Publications in refereed journals:

92. Sinukoff, Evan; Howard, Andrew W.; Petigura, Erik A.; Fulton, Benjamin J.; Isaacson, Howard; Weiss, Lauren M.; Brewer, John M.; Hansen, Brad M. S.; Hirsch, Lea; Christiansen, Jessie L.; Crepp, Justin R.; Crossfield, Ian J. M.; Schlieder, Joshua E.; Ciardi, David R.; Beichman, Charles A.; Knutson, Heather A.; Benneke, Bjoern; Dressing, Courtney D.; Livingston, John H.; Deck, Katherine M.; ***Lépine, Sébastien***; Rogers, Leslie A. 2017, "Mass Constraints of the WASP-47 Planetary System from Radial Velocities", The Astronomical Journal, 153, 70

91. Doyle, T. F.; Howell, S. B.; Petit, V.; ***Lépine, S.*** 2017, "DA white dwarfs in the Kepler field", Monthly Notices of the Royal Astronomical Society, 464, 3464

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a) Professional Credentials

- Georgia State University, Professor, Physics & Astronomy, 8/2013 - present
- Georgia State University, Associate Professor, Physics & Astronomy, 8/2006- 07/2013 (tenured: 8/2012)
- Harvard University, Sr. Research Associate, School of Engineering and Applied Sciences, 10/1998- 7/2006
- University of California, Santa Barbara, Asst. Research Engineer, ECE Department, 5/1997-9/1998
- Max-Planck-Institute for Solid State Physics, Scientist, Stuttgart, Germany, 9/1990 – 4/1997
- University of Maryland, College Park, Research Associate, Department of Physics, 7/1986-9/1990
- University of Maryland, College Park, Graduate Assistant, Department of Physics, 1980 –1986

b) Education

- BS (Physics), MS (Physics), and Ph.D. (Physics): University of Maryland, College Park, MD.

c) Scholarship and Professional Development

Summary:

- Discovered the microwave-induced zero-resistance states in the 2D electron system. Invented and patented the double Hall effect technique in doubly connected specimens. Demonstrated dual simultaneous integral- and fractional- quantum Hall effects, and size dependent giant magnetoresistance in 2D systems.
- Obtained ~$2,500,000 in external funding as Principal Investigator at Georgia State University
- 126 publications with 87 as first author, 142 talks. Worldwide patents as principal inventor and first author.
- Best paper: "Zero-resistance states induced by electromagnetic-wave excitation in GaAs/AlGaAs heterostructures", R. G. Mani et al., Nature (London) **420**, 646 (2002).
- Referee for the National Science Foundation, Department of Energy, Army Research Office, Physical Review Letters, Physical Review B, Nature Physics, Applied Physics Letters, Europhysics Letters, Applied Materials, Scientific Reports, Chem. Of Materials, Physica B & E, Journal of Applied Physics, etc.
- Board of Editors, Nature – Scientific Reports.
- Member of the American Physical Society and Materials Research Society.

Five Selected Publications:

- R. G. Mani, A. Kriisa, and W. Wegscheider, "Size-dependent giant-magnetoresistance in millimeter scale GaAs/AlGaAs 2D electron devices," Nature-Scientific Reports **3**, 2747 (2013) | doi:10.1038/srep02747.
- R. G. Mani, J. Hankinson, C. Berger, and W. de Heer, "Observation of resistively detected hole spin resonance and zero-field pseudo-spin splitting in epitaxial graphene," Nature Comm. **3**:996 (2012).
- R. G. Mani et al., "Demonstration of a 1/4 cycle phase shift in the radiation-induced oscillatory-magnetoresistance in GaAs/AlGaAs devices," Phys. Rev. Lett. **92**, 146801 (2004).
- R. G. Mani, J. H. Smet, K. von Klitzing, V. Narayanamurti, W. B. Johnson, and V. Umansky, "Zero-resistance states induced by electromagnetic-wave excitation in GaAs/AlGaAs heterostructures," Nature **420**, 646 (2002).
- R. G. Mani and K. von Klitzing, "Fractional quantum Hall effects as an example of fractal geometry in nature," Z. Phys. B **100**, 635 (1996).

Popular Write-ups about my Research:

- "Size matters in the giant magnetoresistance effect in semiconductors" http://www.sciencedaily.com/releases/2013/10/131015134926.htm?utm_source=feedburner&utm_medium=feed&utm_campaign=Feed%3A+sciencedaily+%28ScienceDaily%3A+Latest+Science+News%29 (10/2013) http://www.nanowerk.com/news2/newsid=32749.php (10/2013)
- "Physicists explore properties of electrons in revolutionary material," by J. Craig, http://www.sciencedaily.com/releases/2012/08/120810112810.htm (08/2012)
- "Microwaves induce vanishing resistance in two-dimensional electron systems," by R. Fitzgerald, Physics Today **56** (4), 24 (2003)
- "Electromagnetische Wellen verursachen Null-Widerstand," by Jan Oliver Löfkin, Bild der Wissenschaft (German Science Magazine), December 13, 2002. www.wissenschaft.de
- "Halleffekt mit Loch gemessen, by M. Klingenstein," Süddeutsche Zeitung (German newspaper), (1993)

Awards:

- The Ralph D. Myers Award for the Outstanding Graduate Teaching Assistant, University of Maryland
- IBM Research Grant: 1989 – 1990
- Max-Planck-Society Fellowship: 1990 – 1992
- Best Paper Presentation at the 2006 International Symposium on Spectral Sensing Research (ISSSR):
- Elected to Marquis Who's Who in America 2010.

Patents:

- Offset voltage compensated Hall-effect device, R. G. Mani and K. von Klitzing, German Patent Registration, P.4304279.6, P.4308375.7 (1993).
- Hall effect device with current and Hall-voltage contacts, R. G. Mani and K. von Klitzing, PCT registration EP 94/00701; European Patent (France, UK, and Germany) EP0689723; U.S.A. Patent #5,646,527; Japanese Patent Registration HEI-6-519,590; Korean Patent Registration 703,831/95 .
- Method for compensating the piezoresistive offset voltage in doubly connected Hall-effect devices based on Silicon, R. G. Mani and K. von Klitzing, European Patent EP0704710B1, U. S. A. Patent #6,008,643.

Funded Proposals as PI at Georgia State University:

- **Title:** "Two-Dimensional Atomic Layer Systems for Low Dissipation Flexible Device Applications." **Source:** Army Research Office. **Award Amount:** $595,000. Period Covered: 9/1/2015 – 8/31/2018.
- **Title:** "Microwave and terahertz applications of two-dimensional electron systems." **Source:** Army Research Office. **Award Amount:** $339,885. Period Covered: 9/1/2014 – 8/31/2017.
- **Title**: "Magnetotransport studies of the low dimensional electron system." **Source**: Department of Energy. **Award Amount**: $570,355. Period Covered: 9/15/2013 – 9/14/2017.
- **Title**: "Microwave and terahertz photo-excited transport in the two-dimensional electron system." **Source**: Department of Energy. **Award Amount**: $480,000. Period Covered: 9/1/2009 – 8/31/2013.
- **Title**: "Microwave and Terahertz devices based on the photo-excited low dimensional electron system." Source: Army Research Office. **Award Amount**: $279,363. Period Covered: 9/1/2010 – 8/30/2014.
- **Title**: "Terahertz devices based on the photo-excited low-dimensional electron system." **Source**: Army Research Office. **Award Amount**: $164,420. **Period Covered**: 7/1/2007 – 9/30/2011.
- **Title**: Addendum to "Terahertz devices based on the photo-excited low dimensional electron system." **Source**: Army Research Office. **Award Amount**: $56,800. **Period Covered**: 4/1/2009-9/30/2011.
- **Title**: "Study of the microwave-induced zero-resistance states in the two dimensional electron system." **Source**: Georgia State University. **Award Amount**: $10,000. **Period Covered**: 3/26/2007 – 7/1/2008.

Funded Proposals as Principal Author and Co-PI at Harvard University:

- **Title**: "Measurement and Manipulation of Nuclear Spins Embedded in Low Dimensional Electronic Semiconductor Nanostructures: An Experimental Approach to Quantum Computing in Quantum Hall Systems." **Source**: Army Research Office. **Award Amount**: $750,000. **Period Covered**: 6/2001 – 2/2005. **Collaborators**: V. Narayanamurti, V. Privman, and Y-H. Zhang.
- **Title**: "Novel Terahertz Devices in the Low Dimensional Electron System." **Source:** Army Research Office. **Award Amount:** $155,000. **Period Covered:** 7/2005 – 7/2006. **Collaborator:** V. Narayanamurti.
- **Title**: "Nuclear Spin Memory and Logic in Quantum Hall Semiconductor Nanostructures. **Source**: Semiconductor Research Corporation." **Award Amount**: $75,000. **Period Covered**: 12/2000 – 12/2002. **Collaborators**: V. Narayanamurti.

Graduate Students: At Georgia State University - Yu-Ting You, Aruna N. Ramanayaka, Tianyu Ye, G. Chand, P. Thapa, Y. Verma, O. Sarajlic, Zhuo Wang, Han-Chun Liu, K. Baral, M. Cook, D. O'Brien, Binuka Gunawardana, Rasanga Samaraweera, Rasadi Munasinghe, B. Meena, Tharanga Ranjan, Sajith Vithanage, Kushan Wijewardena, Rupesh Ghimire. At Emory University - Annika Kriisa.

Post-doctoral Research Associates: Dr. B. Kaviraj [GSU 2008-2009, now at CEA-Grenoble, France], Dr. Tarek Ghanem [GSU 2009-2010, now in Egypt], Dr. Pramod Kumar [GSU 04/2010-7/2012, now in India], Dr. Z. I. Muhammad [GSU 03/2015 – 12/2015, now in Pakistan], Dr. A. Kriisa [GSU 9/2015 – present].

Experimental Experience: Magnetotransport ($T > 20$ mK, $B < 14$ Tesla) studies of semiconductors, photo-excited transport in the GaAs/AlGaAs and graphene systems, spin resonance in graphene and GaAs/AlGaAs, proximity superconductivity in 3D topological insulators, bulk crystal growth, CVD growth of graphene and boron nitride, optical and electron beam lithography, Ultra High Vacuum techniques, Ballistic Electron Emission Microscopy (BEEM), Scanning Tunneling Microscopy, Scanning Electron Microscopy, microwave- and rf- techniques.

Publication List for R. G. Mani

1) Most popular paper: Zero-resistance states induced by electromagnetic-wave excitation in GaAs/AlGaAs heterostructures, R. G. Mani et al., Nature (London) 420, 646 (2002).
2) Millimeter wave radiation-induced magnetoresistance oscillations in the high quality GaAs/AlGaAs 2D electron system under bichromatic excitation, B. Gunawardana, HC. Liu, R. Samaraweera, M. S. Heimbeck, H. O. Everitt, C. Reichl, W. Wegscheider, J. Inarrea, and R. G. Mani, Phys. Rev. B (under review).
3) Study of the angular phase shift in the polarization angle dependence of the microwave induced magnetoresistance oscillations, H-C. Liu, R. L. Samaraweera, R. G. Mani, C. Reichl, and W. Wegscheider, Phys. Rev. B 94, 245312 (2016) | DOI: 10.1103/PhysRevB.94.245312.
4) Tunable electron heating induced giant magnetoresistance in the high mobility GaAs/AlGaAs 2D electron system, Z. Wang, R. L. Samaraweera, C. Reichl, W. Wegscheider, and R. G. Mani, Nature-Scientific Reports 6, 38516 (2016) |DOI: 10.1038/srep38516.
5) Method for determining the residual electron- and hole- densities about the neutrality point over the gate-controlled n←→p transition in graphene, R. G. Mani, Appl. Phys. Lett. 108, 033507 (2016).
6) Linear polarization study of microwave radiation induced magnetoresistance oscillations: Comparison of power dependence to theory. T. Ye, J. Inarrea, W. Wegscheider, and R. G. Mani, Phys. Rev. B 94, 035305 (2016).
7) Remotely sensed microwave reflection in the microwave irradiated GaAs/AlGaAs two-dimensional electron system, A Kriisa, H-C Liu, R L Samaraweera, M S Heimbeck, H O Everitt, W Wegscheider and R. G. Mani, to be published, Proc. ICPS 2016.
8) Behaviour of Bi-Chromatic Microwave Induced Magnetoresistance Oscillations in High Mobility GaAs/AlGaAs 2D electron Systems, Binuka Gunawardana, Han-Chun Liu, Rasanga L. Samaraweera, C. Reichl, W Wegscheider and R. G. Mani, to be published, Proc. ICPS 2016.
9) Evolution of the frequency-dependent polarization-angle phase-shift in the microwave radiation-induced magnetoresistance oscillations, Han-Chun Liu, Rasanga L. Samaraweera, C. Reichl, W Wegscheider and R. G. Mani, to be published, Proc. ICPS 2016.
10) Comparative study of microwave radiation-induced magneto-resistance oscillations induced by circularly- and linearly- polarized microwaves, T. Ye, H-C. Liu, R. G. Mani, and W. Wegscheider, to be published, Proc. ICPS 2016.
11) Extraction of overlapping radiation-induced magnetoresistance oscillations and bell-shaped giant magnetoresistance in the GaAs/AlGaAs 2DES using a multiconduction model, R L Samaraweera, H C Liu, Z Wang, W Wegscheider and R. G. Mani, to be published, Proc. ICPS 2016.
12) Magnetotransport response in the 3D topological insulator Bi$_2$Te$_3$ with indium superconducting electrodes, to be published, Z. Wang, T. Ye, and R. G. Mani, Proc. ICPS 2016.
13) Magneto-transport characteristics of a 2D electron system driven to negative magneto-conductivity by microwave photoexcitation, R. G. Mani and A. Kriisa**,** to be published, Proc. ICPS 2016.
14) Superconducting-contact-induced resistance-anomalies in the 3D topological insulator Bi_2Te_3, Z. Wang, T. Ye, and R. G. Mani, Appl. Phys. Lett. 107, 172103 (2015).
15) Comparative study of microwave radiation-induced magnetoresistance oscillations induced by circularly- and linearly- polarized microwave radiation, T. Ye, H-C. Liu Z. Wang, W. Wegscheider, and R. G. Mani, Nature - Scientific Reports, 5, 14880 (2015).
16) Frequency-dependent polarization-angle-phase-shift in the microwave-induced magnetoresistance oscillations, H-C. Liu, T. Ye, W. Wegscheider, and R. G. Mani, J. Appl. Phys. 117, 064306 (2015).
17) Evolution of the linear-polarization-angle-dependence of the radiation-induced magnetoresistance-oscillations with microwave power, T. Ye, R. G. Mani, and W. Wegscheider, Appl. Phys. Lett. 105, 191609 (2014).

18) Combined study of microwave-power/linear polarization dependence of the microwave radiation-induced magnetoresistance oscillations in GaAs/AlGaAs devices, T. Ye, H-C. Liu, W. Wegscheider, and R. G. Mani, Phys. Rev. B 89, 155307 (2014).

19) Interaction of microwave radiation with the high mobility two-dimensional electron system in GaAs/AlGaAs heterostructures, A. N. Ramanayaka, T. Ye, H-C. Liu, W. Wegscheider, and R. G. Mani, Physica B 453, 43-48 (2014).

20) Microwave reflection study of ultra high mobility GaAs/AlGaAs 2D electron system at large filling factors, T. Ye, R. G. Mani, and W. Wegscheider, MRS Proceedings, 1635, pp 69-74 (2014)| doi: 10.1557/opl.2014.107

21) Size-dependent giant-magnetoresistance in millimeter scale GaAs/AlGaAs 2D electron devices, R. G. Mani, A. Kriisa, and W. Wegscheider, Nature - Scientific Reports 3, 2747 (2013) | doi:10.1038/srep02747.

22) Magnetotransport characteristics of a two-dimensional electron system driven to negative conductivity by microwave photoexcitation, R. G. Mani and A. Kriisa, Nature - Scientific Reports 3, 3478 (2013)| doi:10.1038/srep03478.

23) Remote sensor response study in the regime of the microwave radiation-induced magnetoresistance oscillations, T. Ye, R. G. Mani, and W. Wegscheider, Appl. Phys. Lett. 103, 192106 (2013).

24) Microwave reflection from the microwave photo-excited high mobility GaAs/AlGaAs two-dimensional electron system, T. Ye, R. G. Mani, and W. Wegscheider, Mater. Res. Soc. Symp. Proc. Vol. 1617, DOI:10.1557/opl.2013.1158

25) Linear polarization rotation study of the microwave-induced magnetoresistance oscillations in the GaAs/AlGaAs system, A. N. Ramanayaka, T. Ye, H-C. Liu, R. G. Mani, and W. Wegscheider, Mater. Res. Soc. Symp. Proc. Vol. 1617, DOI: 10.1557/opl.2013.1159

26) Terahertz photovoltaic detection of cyclotron resonance in the regime of radiation-induced magnetoresistance oscillations, R. G. Mani, A. Ramanayaka, T. Ye, M. Heimbeck, H. Everitt, and W. Wegscheider, Phys. Rev. B 87, 245308 (2013).

27) Remotely sensed transport in microwave photoexcited GaAs/AlGaAs two-dimensional electron system, T. Ye, R. G. Mani, and W. Wegscheider, Appl. Phys. Lett. 102, 242113 (2013).

28) Mesoscale scanning electron and tunneling microscopy study of the surface morphology of thermally annealed copper foils for graphene growth, O. Sarajlic and R. G. Mani, Chem. Of Mat'l. 25, 1643 (2013).

29) Electron heating due to microwave photoexcitation in the high mobility GaAs/AlGaAs two dimensional electron system, A. N. Ramanayaka, R. G. Mani, and W. Wegscheider, in the Proceedings of the 31th International Conference on the Physics of Semiconductors, AIP Conf. Proc. 1566, 233 (2013); doi: 10.1063/1.4848371

30) Observation of linear-polarization sensitivity in the microwave radiation-induced magnetoresistance oscillations, R. G. Mani, A. N. Ramanayaka, and W. Wegscheider, in the Proceedings of the 31th International Conference on the Physics of Semiconductors, AIP Conf. Proc. 1566, 235 (2013); doi: 10.1063/1.4848372

31) Study of reflection and transport in the microwave photo-excited GaAs/AlGaAs two dimensional electron system, T. Ye, R. G. Mani, and W. Wegscheider, in the Proceedings of the 31th International Conference on the Physics of Semiconductors, AIP Conf. Proc. 1566, 291 (2013); doi: 10.1063/1.4848395

32) Topological Hall Insulator, A. Kriisa, R. G. Mani, and W. Wegscheider, in the Proceedings of the 31th International Conference on the Physics of Semiconductors, AIP Conf. Proc. 1566, 195 (2013); doi: 10.1063/1.4848352

33) Observation of resistively detected hole spin resonance and zero-field pseudo-spin splitting in graphene, R. G. Mani, J. Hankinson, C. Berger, and W. A. de Heer, Nature Communications, 3:996, DOI:10.1038/ncomms1986 (2012).

34) Effect of rotation of the polarization of linearly polarized microwaves on the radiation-induced magnetoresistance oscillations, A. N. Ramanayaka, R. G. Mani, J. Inarrea, and W. Wegscheider, Phys. Rev. B 85, 205315 (2012)

35) Observation of linear-polarization-sensitivity in the microwave-radiation-induced magnetoresistance oscillations, R. G. Mani, A. N. Ramanayaka, and W. Wegscheider, Phys. Rev. B 84, 085308 (2011).

36) Microwave induced electron heating in the regime of the radiation-induced magnetoresistance oscillations, A. Ramanayaka, R. G. Mani, and W. Wegscheider, Phys. Rev. B. 83, 165303 (2011).

37) Comparative study of microwave radiation-induced magnetoresistance oscillations in GaAs/AlGaAs devices, R. G. Mani,and W. Wegscheider, IEEE Trans. In Nanotechnology 10, 170 (2011).

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39) Nonlinear growth with the microwave intensity in the radiation-induced magnetoresistance oscillations, R. G. Mani, C. Gerl, S. Schmult, W. Wegscheider, and V. Umansky, Phys. Rev. B 81, 125320 (2010).

40) Transport study of Berry's phase, the resistivity rule, and quantum Hall effect in graphite, A. Ramanayaka and R. G. Mani, Phys. Rev. B 82, 165327 (2010).

41) Sublinear radiation power dependence of photoexcited resistance oscillations in two dimensional electron systems, J. Inarrea, R. G. Mani, and W. Wegscheider, Phys. Rev. B 82, 205321 (2010).

42) Phase study of oscillatory resistances in microwave irradiated and dark GaAs/AlGaAs devices: Indications of an unfamiliar class of integral quantum Hall effect, R. G. Mani, W. B. Johnson, V. Umansky, V. Narayanamurti, and K. Ploog, Phys. Rev. B 79, 205320 (2009).

43) Band-limited radiation-sensing using the radiation-induced magneto-resistance oscillations, R. G. Mani, Intl. J. Mod. Phys. B 23, 2703-2707 (2009).

44) Narrow-band radiation-sensing in the Terahertz and microwave bands using the radiation-induced magnetoresistance oscillations, R. G. Mani, Appl. Phys. Lett. 92, 102107 (2008).

45) Evolution of Shubnikov-de Haas oscillations under photoexcitation in the regime of the radiation-induced zero-resistance states, R. G. Mani, Physica E 40, 1178 (2008), doi:10.1016/j.physe.2007.08.132.

46) Study of transport and devices based on the photo-excited two-dimensional electronic system, R. G. Mani, International Journal of High Speed Electronics and Systems 17, p 777-788 (2007); doi: 10.1142/s0129156407004977.

47) Photo-excited zero-resistance states in quasi two-dimensional GaAs/AlGaAs devices, R. G. Mani, Sol. St. Comm. 144, 409 (2007).

48) Radiation-induced decay of Shubnikov-de Haas oscillations in the regime of the radiation-induced zero-resistance states, R. G. Mani, Appl. Phys. Lett. 91, 132103 (2007).

49) Observation of a uniform temperature dependence in the electrical resistance across the structural phase transition in thin film vanadium oxide, R. G. Mani and S. Ramanathan,, Appl. Phys. Lett. 91, 062104 (2007).

50) Electrical study of device arrays on thin film vanadium oxide, R. G. Mani, S. Ramanathan, and V. Narayanamurti, in Ferroelectrics and Multiferroics, edited by V. Gopalan, J-P. Maria, M. Fiebig, and C-W. Nan (Mater. Res. Soc. Symp. Proc. 966E, Warrendale, PA) 2007, 0966-T10-8.

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Seminars/Talks by R. G. Mani:

1) Impurity potentials and the breakdown of the quantum Hall effect. Princeton University, Princeton, NJ. March 1988. Host: Dr. M. Shayegan.
2) Magnetic field induced localization in narrow gap semiconductors. IBM - Yorktown Heights, Yorktown Heights, NY. May 1989. Host: Dr. S. von Molnar.
3) Magnetic field induced localization in narrow gap semiconductors. AT&T Bell Labs., Murray Hill, NJ. July 1989. Host: Dr. B. Levine.
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5) Magnetic field induced localization in narrow gap semiconductors. Imperial College, London, UK. January 1990. Host: Dr. R. A. Stradling
6) Magnetic field induced localization in narrow gap semiconductors. Univ. of Florida, Gainesville, FL. March 1990. Host: Dr. D. Romero.
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8) Magnetic field induced localization in narrow gap semiconductors. Emory University, Atlanta, GA. April 1990. Host: Dr. S. Perkovitz.
9) Scaling of transport in n-GaAs. IBM - Yorktown Heights, Yorktown Heights, NY. March 28, 1991. Host: Dr. T. N. Theis.
10) Scaling of transport in n-GaAs. Max-Planck-Institut, Stuttgart, Germany. April 1991. Host: Dr. R. Gerhardts.
11) Localization in GaAs/AlGaAs wires. AT&T Bell Labs, Murray Hill, NJ. March 26, 1992. Host: Dr. L. Pfeiffer.
12) Hall effect revisited. Max-Planck-Institut, Stuttgart, Germany. November 2, 1992. Host: Dr. R. Gerhardts.
13) Magnetoresistance in GaAs/AlGaAs quantum wires. MPI-meeting at Schloss Ringberg. November 30, 1992.
14) Measurement and superposition of Hall's effect. Institut National des Sciences Appliques, Toulouse, France. May 14, 1993. Host: Dr. L. Ghenim.
15) Measurement and superposition of Hall's effect. Dept. of Physics, University of Florida, Gainesville, FL. May 24, 1993. Host: Dr. E. Dwight Adams.
16) Measurement and superposition of Hall's effect. National High Magnetic Field Laboratory, Florida State University, Tallahassee, FL. May 25, 1993. Host: Dr. J. E. Crow.
17) Measurement and superposition of Hall's effect. AT&T Bell Laboratories, Murray Hill, NJ. May 27, 1993. Host: Dr. B. Kane.
18) Measurement and superposition of Hall's effect. Department of Physics, University of California at Santa Barbara, Santa Barbara, CA. June 10, 1993. Host: Dr. S. J. Allen, Jr.
19) Hall effect in the anti-Hall bar geometry. International Workshop on Magnetotransport in Structured Inversion Layers, Bad Lauterberg (Harz) Germany. June 30, 1993.
20) Double quantum Hall effects. Department of Physics, Florida State University, Tallahassee, FL. Feb. 21, 1994. Host: Dr. S. von Molnar.
21) Superposition properties of the Hall effect. ITT Intermetall, Freiburg, Germany. March 15, 1994. Host: Dr. L. Blossfeld.
22) Double quantum Hall effects. Dept. of Physics, MIT, Cambridge, MA. March 28, 1994. Host: Dr. R. Ashoori.
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29) Dual ordinary and quantum Hall effects. Dept. of Physics, University of Maryland, College Park. May 1996. Host: Dr. J. R. Anderson.

30) Experimental technique for realizing multiple Hall effects in a single specimen applied to the study of quantum Hall effects and the development of novel Hall sensors. Micro Devices Laboratory, Jet Propulsion Laboratory, Pasadena, CA. September 4, 1998. Host: Dr. A. Kleinsasser.

31) Experimental technique for realizing multiple Hall effects in a single specimen applied to the study of quantum Hall effects and the development of novel Hall sensors. Rutgers University, Piscataway, NJ. May 19, 2000. Host: Dr. David Daut.

32) Development of novel Hall sensors utilizing multiple simultaneous Hall effects. Clarkson University, Potsdam, NY. October 13, 2000. Host: Dr. V. Privman.

33) BEEM under ultra high vacuum conditions. Max-Planck-Institut FkF, Stuttgart, Germany, October 21, 2000. Host: Dr. K. von Klitzing.

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35) Experimental Realization of Multiple Simultaneous Ordinary, Integral Quantum, and Fractional Quantum Hall Effects. University of Georgia, Athens, GA. March 20, 2001. Host: Dr. Uwe Happek.

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38) Microwave-induced photomagnetoresistance in a high mobility two dimensional electron system. Max-Planck-Institut FkF, Stuttgart, Germany. July 13, 2001. Host: Dr. K. von Klitzing.

39) Nuclear spin memory and logic in quantum Hall semiconductor nanostructures for quantum computing applications. Quantum Computing Program Review - 2001, Baltimore, MD. August 29, 2001. Host: Dr. H. Everitt.

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41) Experimental technique for realizing multiple simultaneous Hall effects applied to the study of quantum Hall effects and the development of novel Hall sensors. SUNY- Albany, NY. October 19, 2001. Host: Dr. M. Huang.

42) Approach to quantum computing in quantum Hall systems. Semiconductor Research Corporation, Raleigh, NC. January 18, 2002. Host: Dr. L. Manchanda.

43) Experimental approach to quantum computing and spintronics in the quantum Hall regime. University of Central Florida, Orlando, FL. April 22, 2002. Host: Dr. W. Luo.

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45) Initialization of a nuclear spin system over the quantum Hall regime for quantum information processing. 15th International Conference on the Application of High Magnetic Fields in Semiconductor Physics, Oxford University, Oxford, U.K. August 5, 2002. Organizer: Dr. R. Nicholas.

46) Nuclear spin memory and logic in quantum Hall semiconductor nanostructures for quantum computing applications. Quant. Comput. Program Review - 2002, Nashville, TN. August 21, 2002. Host: Dr. H. Everitt.

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48) Novel zero-resistance-states in a high mobility two-dimensional electron system. Condensed Matter Seminar, Physics Department, Harvard University, Cambridge, MA. September 19, 2002. Host: Dr. E. Demler.

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56) Initialization of a nuclear spin system over the quantum Hall regime for quantum information processing, (Invited Speaker). The 8th International Symposium on Advanced Physical Fields - Advanced Materials for Quantum Computing, Tsukuba, Japan. January 17, 2003. Organizer: Dr. G. Kido.

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62) Zero-resistance states induced by electromagnetic wave excitation in GaAs/AlGaAs heterostructures. Quantum Transport and Correlations in Mesoscopic Systems and QHE, Dresden, Germany. August 12, 2003. Organizers: Drs. V. Falko, B. Altshuler, and A. Ludwig.

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64) Novel zero-resistance state induced by microwave excitation in the high mobility two-dimensional electron system. Michigan State University, Physics Dept., E. Lansing, MI. September 8, 2003. Host: Dr. M. Dykman.

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66) Novel radiation induced zero-resistance states in high mobility two-dimensional electron systems. University of Virginia, Dept. of Physics, Charlottesville, VA. October 23, 2003. Host: Dr. Paul Fendley.

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69) Zero-resistance states induced by electromagnetic wave excitation in GaAs/AlGaAs devices. Arizona State University, Dept. of Electrical Engineering, Tempe, AZ. February 6, 2004. Host: Dr. Y. H. Zhang

70) Novel zero-resistance states induced by photoexcitation in the high mobility two-dimensional electron system, (Invited Speaker). 13th Int'l. Wint. Sch. on New Developments in Sol. St. Physics: Low-Dimensional Systems, Mauterndorf (Salzburg), Austria. February 16, 2004. Organizers: G. Bauer, W. Jantsch, and F. Kuchar.

71) Novel zero-resistance states induced by electromagnetic wave excitation in GaAs/AlGaAs devices. University of Geneva, Switzerland. February 23, 2004. Host: Dr. M. Buttiker.

72) Novel zero-resistance states induced by electromagnetic wave excitation in GaAs/AlGaAs devices. University of Fribourg, Fribourg, Switzerland. February 27, 2004. Host: Dr. C. Morias-Smith.

73) Novel zero-resistance states induced by photoexcitation in the high mobility two-dimensional electron system. Walter Schottky Institut, Technical University - Munich, Munich, Germany. March 2, 2004. Host: Dr. Matthew Grayson.

74) Zero-resistance states induced by electromagnetic wave excitation in GaAs/AlGaAs devices, (Invited Speaker). Spring Meeting of the German Physical Society, Regensburg, Germany. March 9, 2004. Organizers: Drs. R. Haug and B. Kramer.

75) Zero-resistance states induced by electromagnetic waves in a 2DEG, (Invited Speaker). March Meeting of the American Physical Society, Montreal, Canada. March 22, 2004.

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77) Zero-resistances states induced by electromagnetic wave excitation in GaAs/AlGaAs devices. Helsinki University of Technology, Low Temperature Laboratory, Helsinki, Finland. June 18, 2004. Host: Dr. M. Paalanen.

78) Zero-resistance states and oscillatory magnetoresistance induced by microwave excitation in high mobility GaAs/AlGaAs devices, (Invited Speaker). 12th International Symposium: "Nanostructures: Physics and Technology", St. Petersburg, Russia. June 21 - 25, 2004. Organizers: Drs. R. Suris and B. Egorov.

79) Zero-resistance states induced by electromagnetic waves in a 2DEG. Los Alamos National Laboratory, Los Alamos, NM. July 12, 2004. Host. Dr. D. Mozyrsky.

80) Radiation induced zero-resistance states in high mobility GaAs/AlGaAs devices. The 27th International Conference on the Physics of Semiconductors, Flagstaff, AZ. July 27, 2004.

81) Novel zero-resistance states induced by electromagnetic wave excitation in ultra high mobility GaAs/AlGaAs devices. (Invited Speaker). The 16th International Conference on High Magnetic Fields in Semiconductor Physics, Tallahassee, FL. August 2, 2004. Organizer/Chair: Dr. Y-J. Wang.

82) Radiation-induced zero-resistance states in high mobility GaAs/AlGaAs devices, (Invited Speaker). Second Feynmann Festival, University of Maryland, College Park, MD. August 24, 2004. Organizers: Drs.Y. S. Kim and J. R. Anderson.

83) Microwave-induced zero-resistance states in a semiconductor system, University of Buffalo, ECE Dept., Buffalo, NY. September 24, 2004. Host: Dr. V. Mitin.

84) Radiation induced zero-resistance states in the high mobility 2D GaAs/AlGaAs system, (Invited Speaker). The 7th International Conference on Solid-State and Integrated Circuit Technology, Beijing, China. October 18-21, 2004. Organizer/Chair: Dr. Huang Ru.

85) Radiation-induced zero-resistance states in the high mobility two-dimensional electron system. University of Buffalo, Dept. of Physics, Buffalo, NY. November 19, 2004. Host: Dr. S. Fujita.

86) Radiation-induced zero-resistance states in the high mobility 2DES. The Fifth International Conference on Low Dimensional Structures and Devices, Playa del Carmen, Mexico. December 16, 2004. Organizers: Drs. Isaac Hernandez-Calderon and Mohamed Henini.

87) Radiation-induced zero-resistance states in the high mobility two-dimensional electron system. Northeastern University, Dept. of Physics, Boston, MA. February 17, 2005. Host: Dr. S. Kravchenko.

88) Microwave induced vanishing resistance in the ultra high mobility GaAs/AlGaAs two dimensional electron system. University of Texas- Austin, Dept. of Physics, Austin, Texas. February 22, 2005. Host: Dr. A. H. MacDonald.

89) Zero-resistance states induced by microwave photoexcitation in the high mobility GaAs/AlGaAs two dimensional electron system. Texas A&M University, Dept. of Physics, College Station, Texas. February 23, 2005. Host: Dr. J. Sinova.

90) Photoexcited zero-resistance states in the high mobility 2DES. Rice University, Dept. of Physics, Houston, Texas. February 24, 2005. Host: Dr. D. Natelson.

91) Photoexcited zero-resistance states in the high mobility 2DES. University of Chicago, Dept. of Physics, Chicago, IL. March 7, 2005. Host: Dr. Woowon Kang.

92) Microwave excited zero-resistance states in the high mobility 2DES. University of California- Irvine, Dept. of Physics, Irvine, CA. March 16, 2005. Host: Dr. Philip Collins.

93) Photoexcited zero-resistance states in the high mobility 2DES. University of California - Santa Barbara, Dept. of Physics, Santa Barbara, CA. March 17, 2005. Host: Dr. E. Gwinn.

94) Photoexcited zero-resistance states in a quantum Hall system, (Invited Speaker). William Fine Theoretical Physics Institute Workshop on "Non-equilibrium and correlation effects in low-dimensional structures," University of Minnesota, Minneapolis, MN. May 1, 2005. Organizers: Dr. L. Glazman et al.

95) Radiation-induced zero-resistance states in the high mobility two-dimensional electron system. D-Wave Systems, Vancouver, BC. June 3, 2005. Host: Dr. A. J. Berkley.

96) Microwave- and Terahertz- radiation-induced zero-resistance states in high mobility GaAs/AlGaAs devices. The 8th International Conference on Inter-Subband Transitions in Quantum Wells, Cape Cod, MA. September 13, 2005. Organizers: Dr. C. Gmachl et al.

97) Radiation-induced zero-resistance states in the GaAs/AlGaAs two-dimensional electron system, Dept. of Physics. University of Wyoming, Laramie, WY. December 1, 2005. Host: Dr. Y. Dahnovsky.

98) Radiation-induced zero-resistance states in the high mobility GaAs/AlGaAs system. Dept. of Physics and Astronomy, Georgia State University, Atlanta, GA. February 9, 2006. Host: Dr. H. Richard Miller.

99) Terahertz-radiation-induced resistance oscillations and zero-resistance states in high mobility GaAs/AlGaAs devices, 2006 Internationl Symposium on Spectral Sensing Research, Bar Harbor, Maine. June 2, 2006. Organizer: Dr. D. Woolard.

100) Radiation-induced zero-resistance states in the high-mobility GaAs/AlGaAs system, (Invited Speaker). Low Energy Electrodynamics in Solids Conference 2006 (LEES 2006), Laulasmaa Spa, Estonia. July 3, 2006. Organizer: T. Room.

101) Terahertz radiation-induced resistance oscillations and zero-resistance states in high mobility GaAs/AlGaas devices. 28th International Conference on the Physics of Semiconductors, Vienna, Austria. July 27, 2006. Organizers, E. Gornik, F. Kuchar, and G. Bauer.

102) Microwave and Terahertz radiation-induced zero-resistance states in the high mobility GaAs/AlGaAs system. 3rd International Conference on Spontaneous Coherence in Excitonic Systems (ICSCE3), The Center of Physics "Les Houches", France. January 16, 2007. Organizers: D. Snoke and G. Malpuech.

103) Radiation-induced zero-resistance states in low-disorder two-dimensional GaAs/AlGaAs devices, "Georgia Tech School of Physics Colloquium," School of Physics, Georgia Institute of Technology. August 29, 2007. Host: Dr. A. Marchenkov.

104) Zero-resistance states and magneto-resistance oscillations induced by photo-excitation in the quasi-two-dimensional GaAs/AlGaAs system, (Invited Speaker). 2008 Conference on Precision Electromagnetic Measurements (CPEM 2008), Broomfield, CO. June 12, 2008. Organizer: S. Awan and P. Kabos.

105) Zero-resistance states and magneto-resistance oscillations induced by photo-excitation in the quasi-two-dimensional GaAs/AlGaAs system, (Platform Speaker). 2008 International Symposium on Spectral Sensing Research (ISSSR 2008), Hoboken, NJ. June 25, 2008. Organizer: D. Woolard.

106) Co-variation study of the photo-induced decay of Shubnikov-de Haas oscillations in the regime of the radiation-induced zero-resistance states, 18th International Conference on High Magnetic Fields in Semiconductor Physics (HMF-18), Sao Pedro (SP), Brazil. Aug. 5, 2008. Organizers: G. Landwehr and V. Bindilatti.

107) Comparative study of microwave radiation-induced transport in GaAs/AlGaAs devices, (Platform Speaker), Nano-DDS 2009 Conference, Ft. Lauderdale, FL, 30 Sept. 2009. Organizers: The Nano-DDS 2009 Committee.

108) Intensity dependence of microwave radiation-induced magneto-resistance oscillations in the GaAs/AlGaAs system, (Platform Speaker), International Symposium on Spectral Sensing Research, 6/22/2010, Springfield, MO.

109) Microwave- and Terahertz- Photo-Excited Transport in Low-Dimensional Electron Systems (Invited Speaker). DOE BES - Experimental Condensed Matter Physics - PI Meeting Rockville, MD. 8/10/2011. Organizer: A. Schwartz.

110) Photo-excited transport in epitaxial graphene (Platform speaker). Nano-DDS 2011 Conference, Brooklyn, NY. 9/1/2011. Organizers: The Nano-DDS 2011 Committee.

111) Photo-excited transport in epitaxial graphene (Invited Speaker). 3rd International Symposium on the Science and Technology of Epitaxial Graphene, 24-27 Oct. 2011, St. Augustine, FL. Organizers: W. de Heer and C. Berger.

112) Zero-resistance states induced by electromagnetic wave excitation in 2D electron systems (invited speaker). International Workshop on Nonequlibrium Phenomena in Complex Quantum Systems (NPCQS-2012), 23-27 April 2012, Okinawa, Japan. Organizers: D. Konstantinov, K. Kono, and J. Miller.

113) Linear polarization sensitivity and electron heating in the regime of radiation-induced magnetoresistance oscillations, 20th International Conference on High Magnetic Fields in Semiconductor Physics (HMF20), 22 – 27 July 2012, Chamonix, France. Organizers: M. Potemski et al.,

114) Microwave transport study of the GaAs/AlGaAs 2DES and epitaxial graphene (invited speaker). International Workshop "MIRO and all that," 13 - 16 May, 2013, Montpellier, France. Organizers: M. Dyakonov and M. Zudov.

115) Resistively Detected Spin Resonance and Zero-field Pseudo Spin Splitting in Epitaxial Graphene. 20th International conference on Electronic Properties of Two-dimensional Systems, July 1 - 5, 2013, Wroclaw, Poland.

116) Resistively Detected Spin Resonance and Zero-field Pseudo Spin Splitting in Epitaxial Graphene. XXII International Material Research Congress 2013 (IMRC 2013), August 11 -15, 2013. Cancun, Mexico.

117) Linear polarization rotation study of the microwave-induced magnetoresistance oscillations in the GaAs/AlGaAs system. XXII International Material Research Congress 2013 (IMRC 2013), August 11 -15, 2013. Cancun, Mexico.

118) Resistively detected hole spin resonance in epitaxial graphene, R. G. Mani, 2013 Fall MRS Meeting, [1763133] RR2.02, Boston, MA December 2, 2013.

119) Resistively detected hole spin resonance in epitaxial graphene, R. G. Mani, 2014 Spring MRS Meeting, [1881293] OO16.05, San Francisco, CA. April 24, 2014.

120) Combined study of microwave power- and linear polarization rotation- dependence of radiation-induced magnetoresistance oscillations in high mobility two-dimensional electron systems, R. G. Mani, 21st Intl. Conf. On "High Magnetic Fields in Semiconductor Physics" (HMF 21), Aug. 6, 2014, Panama City, FL. Organizers: D. Smirnov and Z. Jiang.

121) Resistively detected hole spin resonance in epitaxial graphene, R. G. Mani, 32nd Intl. Conf. On the Physics of Semiconductors – ICPS 2014, Aug. 14, 2014, Austin, TX.

122) Transport characteristics of the microwave driven 2D negative magneto-conductivity state, R. G. Mani, 32nd Intl. Conf. On the Physics of Semiconductors – ICPS 2014, Aug. 14, 2014, Austin, TX.

123) Size dependent giant magnetoresistance in millimeter-sized GaAs/AlGaAs devices, R. G. Mani, 32nd Intl. Conf. On the Physics of Semiconductors – ICPS 2014, Aug. 15, 2014, Austin, TX.

124) Oscillatory magnetotransport in the high mobility GaAs/AlGaAs system under microwave irradiation: Role of microwave polarization, R. G. Mani, 32nd Intl. Conf. On the Physics of Semiconductors – ICPS 2014, Aug. 14, 2014, Austin, TX.

125) Photoexcited zero-resistance states in high mobility GaAs/AlGaAs devices, R. G. Mani, St. Louis University, Dept. of Physics, St. Louis, MO. Nov. 7, 2014. Host: Dr. Dmitry Solenov.

126) Microwave-induced transport in the GaAs/AlGaAs system, R. G. Mani, Ecole des Sciences Avancees de Luchon – Quantum transport in 2D systems: Session Workshop 2, Luchon-Bagneres, France. 28 May, 2015.

127) Resistively detected spin resonance in graphene, R. G. Mani, 4th International Symposium on Energy Challenges and Mechanics on Small Scales – Graphene Based Nanotechnology for Energy Applications, Session 05G, 13 Aug. 2015. Organizer: Dr. Henry Tan.

128) Simultaneous electron- and hole- currents over the gate-controlled n←→ p transition across the neutrality point in graphene, R. G. Mani, XXIC International Materials Research Congress, Aug. 17, 2015, Cancun, Mexico. (S1B-005)

129) Resistively detected spin resonance in epitaxial graphene, R. G. Mani, XXIC International Materials Research Congress, Aug. 17, 2015, Cancun, Mexico. (S1B-0017).

130) Size dependent giant magnetoresistance in millimeter scale GaAs/AlGaAs devices, R. G. Mani, XXIC International Materials Research Congress, Aug. 18, 2015, Cancun, Mexico. (S7E-0013)

131) Magnetotransport studies of low dimensional electron systems based on GaAs/AlGaAs heterostructures and graphene, R. G. Mani, DOE-Experimental Condensed Matter Physics PI Meeting, Gaithersburg, MD. Sep. 27, 2015.

132) A magnetotransport study of graphene, R. G. Mani, National Institute of Science and Technology (NIST), Gaithersburg, MD. Apr. 10, 2016. Host: Dr. R. Elmquist.

133) Zero-resistance states induced by electromagnetic wave excitation in the high mobility GaAs/AlGaAs 2D electron system. R. G. Mani, Indian Institute of Technology – Bombay, Mumbai, India. June 2, 2016. Host: Prof. K. G. Suresh.

134) Size-dependent giant magnetoresistance in millimeter-scale GaAs/AlGaAs 2D electron devices. R. G. Mani, International Conference on Materials Science and Technology (ICMST)-2016, Pala, Kerala. June 6, 2016.

135) A magnetotransport study of graphene. R. G. Mani, Indian Institute of Technology – Madras, Chennai, India. June 14, 2016. Host: Prof. M. Jaiswal.

136) Zero-resistance states induced by electromagnetic wave excitation in the high mobility GaAs/AlGaAs 2D electron system. R. G. Mani, Indian Institute of Technology – Madras, Chennai, India. June 15, 2016. Host: Prof. M. Jaiswal.

137) Extraction of radiation induced magneto-resistance oscillations from the negative giant magneto-resistance in the GaAs/AlGaAs 2DES. R. G. Mani, International Conference on the Physics of Semiconductors, Beijing, China. August 4, 2016.

138) Comparative study of microwave radiation-induced magneto-resistance oscillations induced by circularly- and linearly- polarized microwaves. R. G. Mani, International Conference on the Physics of Semiconductors, Beijing, China. August 4, 2016.

139) Superconducting contact induced resistance anomalies in the 3D topological insulator Bi_2Te_3. R. G. Mani, The 8th International Conference on Low Dimensional Structures and Devices (LDSD2016), Riviera Maya, Mexico, August 29, 2016. Organizers: M. Henini and I. H-Calderon.

140) Size dependent giant magnetoresistance in millimeter scale GaAs/AlGaAs devices, R. G. Mani, The 8th International Conference on Low Dimensional Structures and Devices (LDSD2016), Riviera Maya, Mexico, August 31, 2016. Organizers: M. Henini and I. H-Calderon.

141) Size dependent giant magnetoresistance in millimeter scale GaAs/AlGaAs devices, R. G. Mani, ECE Department, University of California – Santa Barbara, Dec. 23, 2016. Host. Prof. Kaustav Banerjee

142) Resistively detected spin resonance in graphene, R. G. Mani, ECE Department, University of California – Santa Barbara, Dec. 23, 2016. Host. Prof. Kaustav Banerjee.

Talks Presented at- and Abstracts Submitted to- the Meetings of the American Physical Society:

1. Analysis of bell-shape negative giant magnetoresistance in high mobility GaAs/AlGaAs 2D electron systems using multi-conduction model, R. Samaraweera, H-C. Liu, W. Wegscheider, and R. G. Mani, BAPS.2016.Mar.E54.4. March 15, 2016.
2. Microwave radiation-induced magnetoresistance oscillations in the high mobility GaAs/AlGaAs system under bichromatic excitation, B. Gunawardana, H-C. Liu, R. Samaraweera, W. Wegscheider, and R. Mani, BAPS.2016.Mar.E54.3. March 15, 2016.
3. Frequency dependence of the linear polarization angle phase shift in the microwave radiation-induced magnetoresistance oscillations, H-C. Liu, R. Samaraweera, W. Wegscheider, and R. G. Mani, BAPS.2016.Mar.E54.2. March 15, 2016.
4. Microwave polarization angle study of the radiation-induced magnetoresistance oscillations in the GaAs/AlGaAs 2D electron system under dc current bias, M-Z. Iqbal, H-C. Liu, M. S. Heimbeck, H. O. Everitt, W. Wegscheider, and R. G. Mani, BAPS.2016.Mar.E54.5. March 15, 2016.
5. Study of magnetotransport across the neutrality point in CVD graphene, R. G. Mani, BAPS.2016.Mar.B15.5. March 14, 2016.
6. Large filling factor giant Shubnikov de Haas oscillations in the ultrahigh mobility two-dimensional GaAs/AlGaAs electron system, Z. Wang, R. G. Mani, and W. Wegscheider, BAPS.2016.Mar.F51.11. March 15, 2016.
7. Study of microwave reflection in the regime of the radiation-induced magnetoresistance oscillations in the high mobility GaAs/AlGaAs 2D electron system. A. Kriisa, H-C. Liu, R. L. Samaraweera, M.S. Heimbeck, H. O. Everitt, W. Wegscheider, and R. G. Mani. BAPS.2016.Mar.E54.1. March 15 2016.
8. Magnetic field- and frequency-dependence of the phase-shift f the microwave radiation-induced magnetoresistance oscillations in the GaAs/AlGaAs system. H-C. Liu, T. Ye, W. Wegscheider, and R. G. Mani, Bull. Am. Phys. Soc. 60, Abstract: BAPS.2014.Mar.Y6.8. March 6, 2015.
9. Evolution of the linear polarization angle dependence of the radiation-induced magnetoresistance oscillations with the microwave power, T. Ye, R. G. Mani, and W. Wegscheider, Bull. Am. Phys. Soc. 60, Abstract: BAPS.2015.MAR.G5.2. March 3, 2015.
10. Magnetotransport characteristics of a 2D electron system driven to negative conductivity by microwave photoexcitation, R. G. Mani and A. Kriisa, Bull. Am. Phys. Soc. 60, Abstract: BAPS.2015.Mar.D5.4. March 2, 2015.
11. Closed cycle refrigeration for routine magnetotransport measurements, B. Gunawardana, T. Ye, W. Wegscheider, and R. G. Mani, Bull. Am. Phys. Soc. Abstract: BAPS.2015.MAR. J21.11. March 3, 2015.
12. Magnetotransport response in the 3D topological insulator Bi_2Te_3 with superconducting electrodes, Z. Wang, T. Ye, and R. G. Mani, Bull. Am. Phys. Soc. Abstract: BAPS.2015.MAR. G12.15. March 3, 2015.
13. Determination of graphene layer thickness using optical image processing, M. Cook, and R. G. Mani, Bull. Am. Phys. Soc. Abstract: BAPS.2015.MAR.Y17.14. March 6, 2015.
14. Combined study of microwave-power-dependence and linear-polarization-dependence of the microwave-radiation-induced magnetoresistance oscillations. T. Ye, H-C. Liu, R. G. Mani, and W. Wegscheider, Bull. Am. Phys. Soc. 59, Abstract: BAPS.2014.Mar.A45.10, March 3, 2014.
15. Size-dependent giant-magnetoresistance in millimeter scale GaAs/AlGaAs devices, R. G. Mani, A. Kriisa, and W. Wegscheider, Bull. Am. Phys. Soc. 59, Abstract: BAPS.2014.Mar.A45.11, March 3, 2014.
16. Study of the phase-shift in the linear-polarization-angle-dependence of the microwave radiation-induced magnetoresistance oscillations in the GaAs/AlGaAs system, H-C. Liu, T. Ye, R. G. Mani, and W. Wegscheider, Bull. Am. Phys. Soc. 59, Abstract: BAPS.2014.Mar.A45.12, March 3, 2014.
17. Proximity effect in the 3D topological insulator Bi2Te3, Z. Wang, T. Ye, and R. G. Mani, Bull. Am. Phys. Soc. 59, Abstract: BAPS.2014.Mar.M41.13, March 3, 2014.

18. Electrically detected spin resonance in epitaxial graphene, R. G. Mani, J. Hankinson, C. Berger, and W. A. de Heer, Bull. Am. Phys. Soc. 58, Abstract: BAPS.2013.MAR.J7.2, March 19, 2013.

19. Study of the phase-shift in the linear-polarization-angle dependence of the microwave radiation-induced magnetoresistance oscillations in the GaAs/AlGaAs system, Han-Chun Liu, T. Ye, R. G. Mani, and W. Wegscheider, Bull. Am. Phys. Soc. 58, Abstract: BAPS.2013.MAR.A42.2, March 18, 2013.

20. Study of the correlation between microwave reflection and microwave-induced magnetoresistance oscillations in the GaAs/AlGaAs two dimensional electron system, Tianyu Ye, R. G. Mani, and W. Wegscheider, Bull. Am. Phys. Soc. 58, Abstract: BAPS. 2013.MAR.A42.1, March 18, 2013.

21. Magnetoresistance in thin Bi2Te3 layers contacted by Indium (In) superconducting electrodes, Zhuo Wang and R. G. Mani, Bull. Am. Phys. Soc. 58, Abstract: BAPS.2013.MAR.J12.4, March 19, 2013.

22. Immense weak localization effect in CVD graphene, O. Sarajlic and R. G. Mani, Bull. Am. Phys. Soc. 58, Abstract BAPS.2013.MAR.W5.11, March 21, 2013.

23. Observation of linear polarization sensitivity in the microwave-radiation induced magneto-resistance oscillations, R. G. Mani, A. Ramanayaka, and W. Wegscheider, Bull. Am. Phys. Soc. 57, Abstract # W24.00010, March 1, 2012.

24. Linear polarization rotation study of the radiation-induced magnetoresistance oscillations, A. Ramanayaka, R. G. Mani, J. Inarrea, and W. Wegscheider, Bull. Am. Phys. Soc. 57, Abstract # W24.00013, March 1, 2012.

25. Microwave reflection study of GaAs/AlGaAs devices in the regime of the radiation-induced magnetoresistance oscillations, Tianyu Ye, A. Ramanayaka, R. G. Mani, J. Inarrea, and W. Wegscheider, Bull. Am. Phys. Soc. 57, Abstract # W24.00009, March 1, 2012.

26. Mesoscale STM study of thermally annealed copper foils, Olesya Sarajlic and R. G. Mani, Bull. Am. Phys. Soc. 57, Abstract # T12.00006, Feb. 29, 2012.

27. Magnetotransport study of the topological insulator Bi_2Te_3, P. Kumar, A. Ramanayaka, and R. G. Mani, Bull. Am. Phys. Soc. 57, Abstract # J31.00008, Feb. 28, 2012.

28. Transport study under microwave photoexcitation in epitaxial Graphene, R. G. Mani, J. Hankinson, C. Berger, and W. de Heer, Bull. Am. Phys. Soc. 56, Abstract# x11.00004, March 24, 2011

29. Scanning Tunneling Microscope study of Atomic steps in Gold films on Muscovite Graphite, Olesya Sitnikova and R. G. Mani, Bull. Am. Phys. Soc. 56, Abstract# W21.00004, March 24, 2011

30. Microwave induced electron heating in the regime of the radiation-induced magnetoresistance oscillations, A. Ramanayaka, R. G. Mani, and W. Wegscheider, Bull. Am. Phys. Soc. 56, Abstract# x11.00003, March 24, 2011

31. Remote sensing of transport in microwave photo-excited magnetoresistance oscillations in the GaAs/AlGaAs system, Tianyu Ye, G. Chand, A. Ramanayaka, R. G. Mani, and W. Wegscheider, Bull. Am. Phys. Soc. 56, Abstract# x11.00006, March 24, 2011

32. Microwave photo-voltaic oscillations in the GaAs/AlGaAs system, G. Chand, T. Ye, A. Ramanayaka, R. G. Mani, and W. Wegscheider, Bull. Am. Phys. Soc. 56, Abstract# x11.00011, March 24, 2011

33. Nonlinear growth with the microwave intensity in the microwave radiation-induced magnetoresistance oscillations, R. G. Mani, C. Gerl, S. Schmult, W. Wegscheider, and V. Umansky, Bull. Am. Phys. Soc. Vol. 55, T25.00010 (2010).

34. Microwave polarization study of the radiation-induced magnetoresistance oscillations, Tarek Ghanem, R. G. Mani, and W. Wegscheider, Bull. Am. Phys. Soc. Vol. 55, T25.00011 (2010).

35. Transport study of Berry's phase in highly oriented pyrolytic graphite, Aruna Ramanayaka and R. G. Mani, Bull. Am. Phys. Soc. Vol. 55, A16.00007, (2010).

36. Comparative study of radiation-induced transport in Wegscheider's and Umansky's GaAs/AlGaAs material, R. G. Mani, W. Wegscheider, and V. Umansky. Bull. Am. Phys. Soc. 54, Abstract number Q23.00005 (2009).

37. Transport studies of highly oriented pyrolytic graphite, A. N. Ramanayaka, B. Kaviraj, and R. G. Mani, Bull. Am. Phys. Soc. 54, Abstract number P26.00005 (2009).

38. Transport measurements and simulations of GaAs/AlGaAs ``anti-Hall-bar within a Hall bar" devices, A. Kriisa, and R. G. Mani,Bull. Am. Phys. Soc. 54, Abstract: Q23.00006 (2009).

39. Comparative study of radiation induced magnetoresistance oscillations in MBE material from different sources, R. G. Mani, W. Wegscheider, and V. Umansky, [SESAPS] Bull. Am. Phys. Soc. 54 (16), GC.00004, (2009).

40. Transport measurements of GaAs/AlGaAs devices in the “anti-hall bar within a Hall bar” geometry, A. Kriisa and R. G. Mani, [SESAPS] Bull. Am. Phys. Soc. 54 (16), GC.00005 (2009).

41. Transport studies of Graphite, A. Ramanayaka, B. Kaviraj, and R. G. Mani, [SESAPS] Bull. Am. Phys. Soc. 54 (16), GC.00006, 13 Nov. 2009.

42. Radiation-induced decay of Shubnikov-de Haas oscillations in the regime of the radiation-induced zero-resistance state in GaAs/AlGaAs devices [Q37.00010] , R. G. Mani, Bull. Am. Phys. Soc. 52, xxx (2008).

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44. Experimental technique for the realization of multiple simultaneous Hall effects, R. G. Mani, Bull. Am. Phys. Soc. 51, xx (2007).

45. Remote sensing of the radiation-induced zero-resistance state in the high mobility GaAs/AlGaAs system. R. G. Mani, Bull. Am. Phys. Soc. 51, p. xx (2006).

46. Microwave photoexcited magnetoresistance in the high mobility GaAs/AlGaAs system. R. G. Mani, Bull. Am. Phys. Soc. 50, p. 856, (2005).

47. Zero-resistance states induced by electromagnetic waves in a 2DEG, (Invited Speaker). R. G. Mani, Bull. Am. Phys. Soc. 49, p. 48 (2004).

48. Electrical detection of the spin splitting in GaAs/AlGaAs heterostructures. R. G. Mani, W. B. Johnson, and V. Narayanamurti, Bull. Am Phys. Soc. 48, p. xx (2003).

49. Single particle and collective response in the magnetophotoresistance of a high mobility 2DES under microwave excitation. R. G. Mani et al., Bull. Am. Phys. Soc. 46, p. 972 (2001).

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52. Study of the current distribution in the quantum Hall regime, R. G. Mani, Bull. Am. Phys. Soc. 41, p. 75 (1996).

53. Novel concepts in Hall sensors, R. G. Mani, Bull. Am. Phys. Soc. 41, p. 303 (1996).

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55. Dual fractional quantum Hall effects, R. G. Mani, Bull. Am. Phys. Soc. 40, p. 584 (1995).

56. Transport scaling due to a quantum size effect in GaAs/AlGaAs quantum wires, R. G. Mani et al., Bull. Am. Phys. Soc. 39, (1994).

57. Superposition properties of the Hall effect, R. G. Mani et al., Bull. Am. Phys. Soc. 38, p. 402 (1993).

58. Magnetoresistance in GaAs/AlGaAs quantum wires, R. G. Mani et al., Bull. Am. Phys. Soc. 38, p. 393 (1993).

59. Magnetotransport studies of GaAs/AlGaAs wires, R. G. Mani et al., Bull. Am. Phys. Soc. 37, 343 (1992).

60. Magneto-transport studies of Si and Sn doped GaAs, R. G. Mani, L. Ghenim, and T. N. Theis, Bull. Am. Phys. Soc. 36, 710 (1991).

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66. Long range potentials and the breakdown of the quantum Hall effect in GaAs/AlGaAs, R. G. Mani and J. R. Anderson, Bull. Am. Phys. Soc. 33, 747 (1988).

67. Magnetotransport in HgTe/CdTe superlattices grown by laser MBE, L. Ghenim, R. G. Mani, J. R. Anderson, D. R. Stone, and J. T. Cheung, Bull. Am. Phys. Soc. 33, 402 (1988).

68. Magnetophonon oscillations in n-$Hg_{0.79}Cd_{0.21}Te$, R. G. Mani, L. Ghenim, J. Anderson and D. Nelson, Bull. Am. Phys. Soc. 32, 490 (1987).

Abstracts Submitted To The Meetings of the Materials Research Society:

1) Growth and electrical study of thin film Vanadium Oxide, R. G. Mani, S. Ramanathan, and V. Narayanamurti, 2007 Fall MRS Meeting, Boston, MA. November 28, 2006.

2) Resistively detected hole spin resonance in epitaxial graphene, R. G. Mani, J. Hankinson, C. Berger, and W. A. de Heer, 2013 Fall MRS Meeting, Boston, MA. December 2, 2013 [1763133]. RR2.02

3) Microwave Reflection Study of Ultra High Mobility GaAs/AlGaAs 2D-Electron System at Large Filling Factors, Tianyu Ye, R. G. Mani, and W. Wegscheider, 2013 Fall MRS Meeting, Boston, MA. December 4, 2013 [1758111]. T9.05

4) Study of Length Scales Extracted from Weak Localization in CVD Graphene, O. I. Sarajlic and R. G. Mani, 2013 Fall MRS Meeting, Boston, MA. December 5, 2013 [1760756]. RR15.129

5) Resistively detected hole spin resonance in epitaxial graphene, R. G. Mani, J. Hankinson, C. Berger, and W. de Heer, 2014 Spring MRS Meeting, San Francisco, CA. April 24, 2014 [1881293]. OO16.05

Poster presentations since the Fall of 2006:

1) Growth and electrical study of thin film Vanadium Oxide, R. G. Mani, S. Ramanathan, and V. Narayanamurti, 2007 Fall MRS Meeting, Boston, MA (USA). 28 November 2006.

2) Single chip terahertz and microwave sensing utilizing the radiation-induced magnetoresistance in high mobility two-dimensional electron devices, R. G. Mani, 2007 Nanoelectronic Devices for Defense and Security (Nano-DDS) Conference, 18- 22 June 2007, Washington DC (USA).

3) Scaling of the Shubnikov-de Haas effect on the approach to the radiation-induced zero-resistance state in the GaAs/AlGaAs system, R. G. Mani, International Conference on Electronic Properties of Two-dimensional Systems and Modulated Semiconductor Structures, 15-20 July 2007, Genova, Italy.

4) Photo-induced decay of Shubnikov-de Haas oscillations in the regime of the radiation-induced zero-resistance states in the GaAs/AlGaAs system, R. G. Mani, 2008 International Conference on the Physics of Semiconductors, 28 Jul. – 1 Aug. 2008, Rio de Janeiro, Brazil. (Poster # 166, Tu-PC4).

5) Transport study of highly oriented pyrolytic graphite, R. G. Mani and A. N. Ramanayaka, First Epitaxial Graphene Workshop, Apr. 1 -2, 2009, Georgia Institute of Technology.

6) Hall effect device based on the anti-Hall bar geometry, A. Kriisa, R. G. Mani, and W. Wegscheider, Nano-DDS Conference 2009, 9/29/2009, Fort Lauderdale, FL.

7) Comparative study of radiation-induced transport in different MBE material, R. G. Mani, W. Wegscheider, and V. Umansky, International Symposium for Advanced Nanodevices and Nanotechnology, Dec. 2, 2009, Maui, Hawaii.

8) Transport study of magnetoresistance oscillations in Graphite, A. N. Ramanayaka, and R. G. Mani, International Symposium on Spectral Sensing Research, June 23, 2010, Springfield, MO.

9) Transport study of graphite, A. N. Ramanayaka, and R. G. Mani, 2nd International Symposium on the Science and Technology of Epitaxial Graphene (STEG2), Sept. 14-17, 2010, Amelia Island, Florida.

10) Mesoscale STM study of epitaxial Graphene, P. Kumar, M. Anquez, R. G. Mani, J. Hankinson, C. Berger, and W. de Heer, 2nd International Symposium on the Science and Technology of Epitaxial Graphene (STEG2), Sep. 14-17, 2010, Amelia Island, Florida.

11) Electron-microwave coupling in the GaAs/AlGaAs two dimensional electron system, R. G. Mani and W. Wegscheider, The 7th International Conference on Low Dimensional Structures and Devices, 24 May 2011, Telchac, Nuevo Yucatan, Mexico.

12) Remote sensing of transport under microwave photo-excitation in the two-dimensional electron system (Mo-P-48), T. Ye, A. Ramanayaka, R. G. Mani, and W. Wegscheider, EP2DS19/MSS15 Conference, 7/25 – 7/29 2011, Tallahassee, FL.

13) Microwave-induced electron-heating in the regime of the radiation-induced magnetoresistance oscillations in the GaAs/AlGaAs 2D electron system (Tu-P-82), A. Ramanayaka, R. G. Mani, and W. Wegscheider, EP2DS19/MSS15 Conference, 7/25 – 7/29 2011, Tallahassee, FL.

14) Method for measuring the electron temperature in microwave photo-excited two-dimensional electron systems, A. Ramanayaka, R. G. Mani, and W. Wegscheider, Nano-DDS 2011 Conference, 8/30/2011, Brooklyn, NY.

15) Microwave reflection from the microwave photo-excited two-dimensional electron system, T. Ye, A. Ramanayaka, R. G. Mani, and W. Wegscheider, Nano-DDS 2011 Conference, 8/30/2011, Brooklyn, NY.

16) Study Of The Electron Temperature In The Microwave Photo-Excited GaAs/AlGaAs Two Dimensional Electron System, A. N. Ramanayaka, R. G. Mani, W. Wegscheider, NPCQS International Workshop on Nonequilibrium Phenomena in Complex Quantum Systems, 23-27 April, 2012, Okinawa, Japan.

17) Concurrent study of microwave reflection and transport in the microwave photo-excited high mobility GaAs/AlGaAs two-dimensional electron system, Tianyu Ye, R. G. Mani, W. Wegscheider, NPCQS International Workshop on Nonequilibrium Phenomena in Complex Quantum Systems, 23-27 April, 2012, Okinawa, Japan.

18) Photoexcited Transport In Graphene, Olesya Sarajlic, R. G. Mani, J. Hankinson, C. Berger, and W. de Heer, NPCQS International Workshop on Nonequilibrium Phenomena in Complex Quantum Systems, 23-27 April, 2012, Okinawa, Japan.

19) Microwave photo-excited transport in epitaxial graphene, R. G. Mani, O. Sarajlic, J. Hankinson, C. Berger, and W. de Heer, 20th International Conference on High Magnetic Fields in Semiconductor Physics (HMF20), 22 – 27 July 2012, Chamonix, France.

20) Microwave reflection and transport in the microwave photo-excited high mobility GaAs/AlGaAs two-dimensional electron system, T. Ye, A. N. Ramanayaka, R. G. Mani, and W. Wegscheider, 20th International Conference on High Magnetic Fields in Semiconductor Physics (HMF20), 22 – 27 July 2012, Chamonix, France.

21) Electron heating due to microwave photoexcitation in the high mobility gaas/algaas two dimensional electron system**,** A. N. Ramanayaka, R. G. Mani, and W. Wegscheider, 31th International Conference on the Physics of Semiconductors 2012, 29 July – 3 August 2012, Zurich, Switzerland.

22) Topological Hall Insulator, A. Kriisa, R. G. Mani, and W. Wegscheider, 31th International Conference on the Physics of Semiconductors 2012, 29 July – 3 August 2012, Zurich, Switzerland.

23) Magnetoresistance in the topological insulator Bi_2Te_3, P. Kumar, A. Ramanayaka, and R. G. Mani, 31th International Conference on the Physics of Semiconductors 2012, 29 July – 3 August 2012, Zurich, Switzerland.

24) Study of reflection and transport in the microwave photoexcited GaAs/AlGaAs two dimensional electron system, T. Ye, R. G. Mani, and W. Wegscheider, 31th International Conference on the Physics of Semiconductors 2012, 29 July – 3 August 2012, Zurich, Switzerland.

25) Observation of linear-polarization-sensitivity in the microwave-radiation-induced magnetoresistance oscillations, R. G. Mani, A. N. Ramanayaka, and W. Wegscheider, 31th International Conference on the Physics of Semiconductors 2012, 29 July – 3 August 2012, Zurich, Switzerland.

26) Linear polarization rotation study of the microwave radiation-induced magnetoresistance oscillations in the GaAs/AlGaAs system, A. N. Ramanayaka, T. Ye, H. C. Liu, R. G. Mani, and W. Wegscheider, 20th International Conference on Electronic Properties of Two-dimensional Systems, 1 – 5 July 2013, Wroclaw, Poland.

27) Nonlinear growth in the microwave reflection signal from the GaAs/AlGaAs 2DES in the regime of radiation-induced magnetoresistance oscillations, Tianyu, Ye, R. G. Mani, and W. Wegscheider, 20th International Conference on Electronic Properties of Two-dimensional Systems, 1 – 5 July 2013, Wroclaw, Poland.

28) Microwave Reflection from the Microwave Photo-Excited High Mobility GaAs/AlGaAs Two-Dimensional Electron System, Tianyu Ye, R. G. Mani, and W. Wegscheider, XXII International Materials Research Conference, 11 – 15 August 2013, Cancun, Mexico.

29) Magnetotransport studies of the low dimensional electron system, R. G. Mani, DOE-BES Experimental Condensed Matter Physics PI Meeting, 23-25 Sept. 2013, Rockville, MD.

30) Study of phase shift under rotation of linear microwave polarization in microwave induced oscillations, H-C. Liu, T. Ye, W. Wegscheider, and R. G. Mani, 21st Intl. Conf. On "High Magnetic Fields in Semiconductor Physics" (HMF 21), Aug. 4, 2014, Panama City, FL. Organizers: D. Smirnov and Z. Jiang.

31) Size dependent giant magnetoresistance in millimeter scale GaAs/AlGaAs devices, R. G. Mani, A. Kriisa, and W. Wegscheider, 21st Intl. Conf. On "High Magnetic Fields in Semiconductor Physics" (HMF 21), Aug. 4, 2014, Panama City, FL. Organizers: D. Smirnov and Z. Jiang.

32) Proximity effect in the 3D topological insulator Bi_2Te_3, Z. Wang, T. Ye, and R. G. Mani, 21st Intl. Conf. On "High Magnetic Fields in Semiconductor Physics" (HMF 21), Aug. 4, 2014, Panama City, FL. Organizers: D. Smirnov and Z. Jiang.

33) Magneto-transport characteristics of a 2D electron system driven to negative magneto-conductivity by microwave photoexcitation, R. G. Mani and A. Kriisa, 21st Intl. Conf. On "High Magnetic Fields in Semiconductor Physics" (HMF 21), Aug. 4, 2014, Panama City, FL. Organizers: D. Smirnov and Z. Jiang.

34) Influence of sample geometry on the phase shift in the linear-polarization-angle dependence of radiation-induced magnetoresistance oscillations in the GaAs/AlGaAs system, H-C. Liu, T. Ye, R. G. Mani, and W. Wegscheider, 32nd Intl. Conf. on the Physics of Semiconductors – ICPS 2014, H2 Aug. 12, 2014, Austin, TX.

35) Combined study of microwave-power dependence & linear polarization dependence of microwave radiation-induced magnetoresistance oscillations, T. Ye, H. C. Liu, R. G. Mani, and W. Wegscheider, 32nd Intl. Conf. on the Physics of Semiconductors – ICPS 2014, I1 Aug. 12, 2014, Austin, TX.

36) Size dependent giant magnetoresistance in millimeter scale GaAs/AlGaAs devices, R. G. Mani, A. Kriisa, and W. Wegscheider, 21st International Conference on Electronic Properties of Two-Dimensional Systems. 26 July 2015, Sendai, JP. (Mo-PE-40)

37) Magneto-transport Characteristics of a 2D Electron System Driven to Negative Magneto-conductivity by Microwave Photo-excitation, R. G. Mani and A. Kriisa, 21st International Conference on Electronic Properties of Two-Dimensional Systems. 26 July 2015, Sendai, JP. (Th-PE-65)

38) Simultaneous power-and linear-polarization-angle-dependence study of microwave induced magnetoresistance oscillations, T. Ye, H-C. Liu, R. G. Mani and W. Wegscheider, 21st International Conference on Electronic Properties of Two-Dimensional Systems. 26 July 2015, Sendai, JP. (Mo-PE-41)

39) Proximity Effect in 3D Topological Insulator Bi_2Te_3, Z. Wang, T. Ye, and R. G. Mani, 21st International Conference on Electronic Properties of Two-Dimensional Systems. 26 July 2015, Sendai, JP. (Mo-PE-93)

40) Frequency-dependent polarization-angle-phase-shift in the microwave-induced magnetoresistance oscillations. H-C. Liu, T. Ye, R. G. Mani, and W. Wegscheider, 21st International Conference on Electronic Properties of Two-Dimensional Systems. 26 July 2015, Sendai, JP. (Tu-PE-38)

41) Microwave radiation-induced magnetoresistance oscillations in the high mobility GaAs/AlGaAs system under bichromatic excitation, Binuka Gunawardana, Han-Chun Liu , Rasanga L. Samaraweera, C. Reichl, W. Wegscheider and R. G. Mani, ICPS 2016 – 33rd International Conference on the Physics of Semiconductors. 8/2/2016, Beijing, China. Tu-P.156

42) Remotely sensed microwave reflection in microwave irradiated GaAs/AlGaAs two-dimensional electron system, Annika Kriisa, H-C. Liu, R. L. Samaraweera, M. S. Heimbeck, H. O. Everitt, W. Wegscheider, and R. G. Mani, ICPS 2016 – 33rd International Conference on the Physics of Semiconductors. 8/2/2016, Beijing, China. Tu-P.157

43) Magneto-transport Characteristics of a 2D Electron System Driven to Negative Magneto-conductivity by Microwave Photo-excitation, R. G. Mani and A. Kriisa, ICPS 2016 – 33rd International Conference on the Physics of Semiconductors. 8/1/2016, Beijing, China. Mo-P.152

44) Simultaneous electron- and hole- currents over the gate-controlled n <-> p transition across the neutrality point in graphene, R. G. Mani, ICPS 2016 – 33rd International Conference on the Physics of Semiconductors. 8/4/2016, Beijing, China. Th-P.072

45) Evolution of the frequency-dependent polarization-angle phase-shift in the microwave radiation-induced magnetoresistance oscillations, Han-Chun Liu, Rasanga L. Samaraweera, R. G. Mani, and W. Wegscheider, ICPS 2016 – 33rd International Conference on the Physics of Semiconductors. 8/1/2016, Beijing, China. Mo-P.156

46) Extracting and characterizing the microwave-induced magneto-resistance oscillations from bell-shape negative giant magnetoresistance in the GaAs/AlGaAs 2DES, Rasanga. L. Samaraweera, Han-Chun Liu, Zhuo Wang, W. Wegscheider & Ramesh G. Mani, ICPS 2016 – 33rd International Conference on the Physics of Semiconductors. 7/31/2016-8/5/2016, Beijing, China

47) Superconducting-contact-induced resistance-anomalies in the 3D topological insulator Bi_2Te_3, Zhuo Wang, Tianyu Ye, and R. G. Mani, ICPS 2016 – 33rd International Conference on the Physics of Semiconductors. 7/31/2016-8/5/2016, Beijing, China.

48) Giant magneto-resistance induced by a dc current bias in the high mobility GaAs/AlGaAs system, Zhuo Wang, R. Samaraweera, W. Wegscheider, and R. G. Mani, ICPS 2016 – 33rd International Conference on the Physics of Semiconductors. 8/4/2016, Beijing, China. Th-P.149

49) Comparative study of microwave radiation-induced magnetoresistance oscillations induced by circularly- and linearly- polarized microwaves, Tianyu Ye, H-C. Liu, W. Wegscheider, and R. G. Mani, ICPS 2016 – 33rd International Conference on the Physics of Semiconductors. 7/31/2016-8/5/2016, Beijing, China

50) Study of the quasi-continuous evolution of the phase shift in a linear polarization angle of the microwave radiation-induced magnetoresistance oscillations, H-C. Liu, R. L. Samaraweera, C. Reichl, W. Wegscheider, and R. G. Mani, LDSD 2016 – The Eight International Conference on Low dimensional Structures and Devices, Maya Riviera, Mexico. August 31, 2016. Organizers: M. Henini and Isaac Hernandez-Calderon. (Tu-P23)

51) Magnetoresistance oscillations induced by bichromatic microwave excitation in the high mobility GaAs/AlGaAs system, B. Gunawardana, H-C. Liu, R. L. Samaraweera, W. Wegscheider, and R. G. Mani, LDSD 2016 – The Eight International Conference on Low dimensional Structures and Devices, Maya Riviera, Mexico. August 31, 2016. Organizers: M. Henini and Isaac Hernandez-Calderon. (Tu-P.22)

52) Study of co-existing radiation-induced magneto-resistance oscillations and bell-shape negative magnetoresistance in the GaAs/AlGaAs 2DES. R. L. Samaraweera,, H-C. Liu, Z. Wang, W. Wegscheider, and R. G. Mani, LDSD 2016 – The Eight International Conference on Low dimensional Structures and Devices, Maya Riviera, Mexico. August 31, 2016. Organizers: M. Henini and Isaac Hernandez-Calderon. (Tu-P25)

Talks by my Graduate Students & Postdocs:

1) Transport evolution from graphite to graphene, A. Ramanayaka [platform speaker] and R. G. Mani, Nano-DDS 2009 Conference, Ft. Lauderdale, FL, 30 Sept. 2009.

2) Polarization rotation study of the radiation-induced magneto-resistance oscillations. A. Ramanayaka and R. G. Mani, International Workshop on Nonequlibrium Phenomena in Complex Quantum Systems (NPCQS-2012), 23-27 April 2012, Okinawa, Japan. Organizers: D. Konstantinov, K. Kono, and J. Miller.

3) Proximity effect in the topological insulator Bismuth Telluride, Z. Wang, T. Ye, and R. G. Mani, 32nd Intl. Conf. on the Physics of Semiconductors – ICPS 2014, Aug. 14, 2014, Austin, TX.

4) Study of microwave reflection in the regime of the radiation-induced magnetoresistance oscillations in the high mobility GaAs/AlGaAs 2D electron system, A. Kriisa, H. C. Liu, R. Samaraveera, M. S. Heimbeck, H. O. Everitt, W. Wegscheider, and R. G. Mani, International Conference on Materials Science and Technology (ICMST)-2016, Pala, Kerala. June 6, 2016.

5) Comparative study of radiation-induced magnetoresistance oscillations and remotely sensed reflected power signal in a high mobility GaAs/AlGaAs 2DES. LDSD 2016 – The Eight International Conference on Low dimensional Structures and Devices, Maya Riviera, Mexico. August 30, 2016. Organizers: M. Henini and Isaac Hernandez-Calderon.

Chaired Conference Sessions:

1) First Epitaxial Graphene Workshop, Apr. 1 -2, 2009, Georgia Institute of Technology: Session: Electronic Transport, Thursday, April 2, 2009. Chair: Ramesh Mani.

2) 2009 American Physical Society March Meeting, March 16-20, 2009, Pittsburgh, PA: APS Meeting Session Q23: Quantum Hall effect: Tunneling, High Frequency, Chair: Ramesh Mani.

3) 2009 Southeastern Section Meeting of the American Physical Society, Nov. 12, 2009, Atlanta, GA: Session: DC Condensed Matter 1, Chair: Ramesh Mani.

4) 2nd International Symposium on the Science and Technology of Epitaxial Graphene (STEG2) at Amelia Island, Florida. Sep. 16, 2010. Session: Landau Levels Imaging. Chair: Ramesh Mani.

5) 2011 American Physical Society March Meeting, March 21-25, 2011, Dallas, TX: APS Meeting Session X11: Integer Quantum Hall effect. Chair: Ramesh Mani.

6) International Workshop on Nonequilibrium Phenomena in Complex Quantum Systems (NPCQS2012,) Okinawa, Japan. Session on ESR and Spin Qubits, April 25, 2012. Chair: Ramesh Mani

7) 32nd Intl. Conf. On the Physics of Semiconductors – ICPS 2014, Aug. 14, 2014, Austin, TX. Session: Topological Insulator 1 (Invited), Aug. 11, 2014. Chair: Ramesh Mani

8) The 8th International Conference on Low Dimensional Structures and Devices "LDSD 2016", Session: Aug. 31, 2016. 11:00am-12:15 pm. Chair: Ramesh Mani

Instruction including advising

Courses Taught by course titles at Georgia State University:

- Introductory Physics I
- Introductory Physics II
- Advanced Physics Laboratory
- Modern Physics II
- Honors Modern Physics II
- Modern Physics for Secondary Teachers II
- Research Topics in Physics
- Directed Study in Physics
- Thesis Research
- Doctoral Dissertation Research

Courses Taught by Semester at Georgia State University:
Fall 2006:
Introductory Physics I - 81489 - Phys 1111k - 065
Introductory Physics I - 81492 - Phys 1111k - 070
Introductory Physics I - 81493 - Phys 1111k - 075

Spring 2007:
Introductory Physics II - 11564 - Phys 1112k - 065
Introductory Physics II - 11566 - Phys 1112k - 065
Introductory Physics II - 11567 - Phys 1112k – 065

Introductory Physics II - 15957 - Phys 1112k – 080
Introductory Physics II - 15960 - Phys 1112k - 085
Introductory Physics II - 15959 - Phys 1112k - 090
Research Topics In Physics - 17266 - Phys 8710 - 065

Summer 2007:
Research Topics In Physics - 53532 - Phys 8710 - 035
Directed Study In Physics - 53533 - Phys 8910 - 025
Thesis Research - 53534 - Phys 8999 - 055

Fall 2007:
Introductory Physics I - 81404 - Phys 1111k - 065
Introductory Physics I - 81404 - Phys 1111k - 070
Introductory Physics I - 81404 - Phys 1111k - 075
Research Topics In Physics - 86698 - Phys 8710 – 030
Directed Study In Physics - 86699 - Phys 8910 – 010
Doctoral Dissertation Research - 86701 - Phys 9999 – 010

Spring 2008:
Research Topics In Physics - 16085 - Phys 8710
Directed Study In Physics - 16088 - Phys 8910
Thesis Research - 16087- Phys 8999
Doctoral Dissertation Research - 16086 - Phys 9999

Summer 2008:
Research Topics In Physics - 52962 - Phys 8710
Directed Study In Physics - 52963 - Phys 8910
Thesis Research – 52964 -Phys 8999
Doctoral Dissertation Research - 54965 - Phys 9999

Fall 2008:
Introductory Physics I – 81313 - Phys 1111K
Introductory Physics I – 81316 -Phys 1111K
Introductory Physics I – 81317 -Phys 1111K
Research Topics In Physics - 85540 - Phys 8710
Directed Study In Physics - 85541 -Phys 8910
Thesis Research – 85542 - Phys 8999
Doctoral Dissertation Research - 85543 -Phys 9999

Spring 2009:
Introductory Physics II - 12909 - Phys 1112k - 065
Introductory Physics II - 12910 - Phys 1112k - 065
Introductory Physics II - 15170 - Phys 1112k – 065
Research Topics In Physics - 16640 - Phys 8710
Directed Study In Physics - 16643 - Phys 8910
Thesis Research - 16642- Phys 8999
Doctoral Dissertation Research - 16641 - Phys 9999

Summer 2009:
Research Topics In Physics - 52562 - Phys 8710
Directed Study In Physics - 52563 - Phys 8910
Thesis Research – 52564 -Phys 8999
Doctoral Dissertation Research - 54565 - Phys 9999

Fall 2009:
Introductory Physics I – 86798 - Phys 1111K
Introductory Physics I – 86799 -Phys 1111K
Introductory Physics I – 86800 -Phys 1111K
Research Topics In Physics - 84627 - Phys 8710
Directed Study In Physics - 84628 -Phys 8910
Thesis Research – 84629 - Phys 8999
Doctoral Dissertation Research - 84630 -Phys 9999

Spring 2010:
Introductory Physics I – 13527 - Phys 1111K
Introductory Physics I – 13531 -Phys 1111K
Introductory Physics I – 13532 -Phys 1111K
Modern Physics II – 12837 – Phys 3402
Honors Modern Physics II – 18199 – Phys 3402
Modern Physics for Secondary Teachers II – 12838 – Phys 7480
Research Topics In Physics - 14387 - Phys 8710
Directed Study In Physics - 14390 -Phys 8910
Thesis Research – 14389 - Phys 8999
Doctoral Dissertation Research - 14388 -Phys 9999

Summer 2010:
Research Topics In Physics - 52339 - Phys 8710
Directed Study In Physics - 52340 - Phys 8910
Thesis Research – 52341 -Phys 8999
Doctoral Dissertation Research - 52342 - Phys 9999

Fall 2010:
Introductory Physics I – 81022 - Phys 1111K
Introductory Physics I – 81021 -Phys 1111K
Introductory Physics I – 81023 -Phys 1111K
Introductory Physics I – 83619 - Phys 1111K

Introductory Physics I – 81024 -Phys 1111K
Introductory Physics I – 83222 -Phys 1111K
Research Topics In Physics - 84173 - Phys 8710
Directed Study In Physics - 84174 -Phys 8910
Thesis Research – 84175 - Phys 8999
Doctoral Dissertation Research - 84176 -Phys 9999

Spring 2011:
Introductory Physics II – 11123 - Phys 1112K
Introductory Physics II – 11125 -Phys 1112K
Introductory Physics II – 11124 -Phys 1112K
Research Topics In Physics - 13997 - Phys 8710
Directed Study In Physics - 14000 -Phys 8910
Thesis Research – 13999 - Phys 8999
Doctoral Dissertation Research - 13998 -Phys 9999

Summer 2011:
Research Topics In Physics - 52178 - Phys 8710
Directed Study In Physics - 52179 -Phys 8910
Thesis Research – 52180 - Phys 8999
Doctoral Dissertation Research - 52181 -Phys 9999

Fall 2011:
Introductory Physics I – 80862 - Phys 1111K
Introductory Physics I – 80863 -Phys 1111K
Introductory Physics I – 80864 -Phys 1111K
Advanced Physics Laboratory - 84720 – Phys 3300
Research Topics In Physics - 83667 - Phys 8710
Directed Study In Physics - 83668 -Phys 8910
Thesis Research – 83669 - Phys 8999
Doctoral Dissertation Research - 83670 -Phys 9999

Spring 2012:
Modern Physics II - -17168 – Phys 3402
Research Topics In Physics - 13613 - Phys 8710
Directed Study In Physics - 13616 -Phys 8910
Thesis Research – 13615 - Phys 8999
Doctoral Dissertation Research - 13614 -Phys 9999

Summer 2012:
Research Topics In Physics - 52049 - Phys 8710
Directed Study In Physics - 52050 -Phys 8910
Thesis Research – 52051 - Phys 8999
Doctoral Dissertation Research - 52052 -Phys 9999

Fall 2012:
Advanced Physics Laboratory - 87520 – Phys 3300
Advanced Physics Laboratory - 84204 – Phys 3300
Research Topics In Physics - 83334 - Phys 8710
Directed Study In Physics - 83335 -Phys 8910
Thesis Research – 83336 - Phys 8999
Doctoral Dissertation Research - 83337 -Phys 9999

Spring 2013:
Modern Physics II - 15974 – Phys 3402
Research Topics In Physics - 13357 - Phys 8710

Directed Study In Physics - 13360 -Phys 8910
Thesis Research – 13359 - Phys 8999
Doctoral Dissertation Research - 13358 -Phys 9999

Summer 2013:

Research Topics In Physics - 51973 - Phys 8710
Directed Study In Physics - 51974 -Phys 8910
Thesis Research – 51975 - Phys 8999
Doctoral Dissertation Research - 51976 -Phys 9999

Fall 2013:

Research Topics In Physics - 83128 - Phys 8710
Directed Study In Physics - 83129 -Phys 8910
Thesis Research – 83130 - Phys 8999
Doctoral Dissertation Research - 83131 -Phys 9999

Spring 2014:

Introductory Physics 1 – 12867 – Phys 1111K
Introductory Physics 1 – 10897 – Phys 1111K
Modern Physics II - 15384 – Phys 3402
Research Topics In Physics - 13162 - Phys 8710
Directed Study In Physics - 13165 -Phys 8910
Thesis Research – 13164 - Phys 8999
Doctoral Dissertation Research - 13163 -Phys 9999

Summer 2014:

Research Topics In Physics - 51809 - Phys 8710
Directed Study In Physics - 51810 -Phys 8910
Thesis Research – 51811 - Phys 8999
Doctoral Dissertation Research - 51812 -Phys 9999

Fall 2014:

Research Topics In Physics - 82842 - Phys 8710
Directed Study In Physics - 82843 -Phys 8910
Thesis Research – 82844 - Phys 8999
Doctoral Dissertation Research - 82845 -Phys 9999

Spring 2015:

Introductory Physics 1 – 10829 – Phys 1111K
Introductory Physics 1 – 12639 – Phys 1111K
Modern Physics II - 14887 – Phys 3402
Research Topics In Physics - 12914 - Phys 8710
Directed Study In Physics - 12917 -Phys 8910
Thesis Research – 12916 - Phys 8999
Doctoral Dissertation Research - 12915 -Phys 9999

Summer 2015:

Research Topics In Physics - 51713 - Phys 8710
Directed Study In Physics - 51714 -Phys 8910
Thesis Research – 51715 - Phys 8999
Doctoral Dissertation Research - 51716 -Phys 9999

Fall 2015:

Introductory Physics 2 – 80643- Phys 1112K
Introductory Physics 2 – 89228- Phys 1112K

Research Topics In Physics - 82661 - Phys 8710
Directed Study In Physics - 82662 -Phys 8910
Thesis Research – 82663 - Phys 8999
Doctoral Dissertation Research - 82664 -Phys 9999

Spring 2016:

Introductory Physics 1 – 10829 – Phys 1111K
Introductory Physics 1 – 12639 – Phys 1111K
Modern Physics II - 14887 – Phys 3402
Research Topics In Physics - 12914 - Phys 8710
Directed Study In Physics - 12917 -Phys 8910
Thesis Research – 12916 - Phys 8999
Doctoral Dissertation Research - 12915 -Phys 9999

Summer 2016:

Research Topics In Physics - 51713 - Phys 8710
Directed Study In Physics - 51714 -Phys 8910
Thesis Research – 51715 - Phys 8999
Doctoral Dissertation Research - 51716 -Phys 9999

Fall 2016:

Introductory Physics 2 – 80643- Phys 1112K
Introductory Physics 2 – 89228- Phys 1112K
Research Topics In Physics - 82661 - Phys 8710
Directed Study In Physics - 82662 -Phys 8910
Thesis Research – 82663 - Phys 8999
Doctoral Dissertation Research - 82664 -Phys 9999

Graduate Student Advisees and their Research Topics:

- Yu-Ting You [2007-2008]: "Transport in GaAs/AlGaAs devices"
- Aruna N. Ramanayaka [2007-2012]: "Transport in graphite", "Radiation-induced transport in GaAs/AlGaAs devices"
- Tianyu Ye [2009-present]: "Remote sensing of radiation-induced transport in GaAs/AlGaAs devices"
- Ganesh Chand [2009-2011]: "Microwave induced photo-voltaic effect in GaAs/AlGaAs devices"
- Prakash Thapa [2010-2012]: "Microwave induced photo-voltaic effect in GaAs/AlGaAs devices"
- Yashwant Verma [2010-2011]: "Noise reduction in Atomic Force Microscopy"
- Annika Kriisa [2007-present, Emory University]: "Transport study of anti-Hall bar within a Hall bar devices"
- Olesya Sarajlic [Fall 2011-Fall 2013]: "STM study of annealed copper surfaces"
- Zhuo Wang [Fall 2011-present]: "Bismuth Telluride"
- Han-Chun Liu [Fall 2011-present]: "Characterization studies of graphene"
- Kapil Baral [Summer 2012 – Fall 2013]: "Transport in high mobility GaAs/AlGaAs devices"
- Monica Cook [Summer 2014 – Fall 2015]: "Exfoliation of 2D materials"
- Binuka Gunawardana [Fall 2014 – present]: "Closed cycle refrigerator based low temperature measurements"
- Dave O'Brien [Fall 2014 – Fall 2014]: "Layered 2D materials"
- Rasadi Munasinghe [Fall 2015 – present]: "Characterization of graphene flakes"
- Tharanga Ranjan [Fall 2015 – present]: "Layered 2D materials"
- Beena Meena [Fall 2015 – Fall2016]: "Layered 2D materials"
- Kushan Wijewardena [Fall 2016 – present]: "Closed cycle refrigeration for low temperatures"
- Sajith Withanage [Fall 2016 – present]: "Cvd growth of graphene"
- Rupesh Ghimire [Fall 2016 – present]: "Polymer based transfer of CVD graphene"

Graduate Student Degree Recipients at GSU:

- Aruna N. Ramanayaka, MS (Physics) - 12/2011: "Microwave induced electron heating in the GaAs/AlGaAs system"
- Prakash Thapa, MS (Physics) – 6/2012: "A study of graphene"
- Aruna N. Ramanayaka, Ph.D. (Physics) – 8/2012: "Magnetotransport in two-dimensional electron systems under microwave excitation and in highly oriented pyrolytic graphite"
- Tianyu Ye, MS (Physics) – 06/2013: "Microwave reflection from two dimensional electron gas and its correlation with microwave induced magnetoresistance oscillations"
- Zhuo Wang, MS (Physics) – 11/2013: "Proximity effect in the 3D topological insulator Bi2Te3"
- Olesya Sarajlic, MS (Physics) – 11/2013: "Mesoscale Scanning Electron and Tunneling Microscopy Study of the Surface Morphology of Thermally Annealed Copper Foils for Graphene Growth"
- Han-Chun Liu, MS (Physics) – 04/2014: "Study of the phase-shift in the angle-dependence of the microwave-induced magnetoresistance oscillations"
- Tianyu Ye, Ph.D. (Physics) – 6/2015: "Magnetotransport and remote sensing of microwave reflection from two-dimensional electron systems under microwave excitation."
- Han-Chun Liu, Ph.D. (Physics) – 12/2016: "Polarization rotation study of the microwave induced magnetoresistance oscillations in the GaAs/AlGaAs system"
- Rasanga Samaraweera, MS (Physics) – 12/2016: "Extraction of overlapping radiation induced magneto-resistance oscillations and bell-shape negative-GMR using multi-conduction model in the GaAs/AlGaAs 2DES"
- Binuka Gunawardana, MS (Physics) – 12/2016: " Transport under bichromatic excitation in the GaAs/AlGaAs 2DES"

Awards received by my graduate students at GSU:

- Aruna N. Ramanayaka, The Outstanding Graduate Student Teaching Award for 2009 – 2010
- Aruna N. Ramanayaka, The Joseph Hadley Outstanding Advanced Graduate Student Award in Physics & Astronomy - 2012
- Olesya I. Sarajlic, The Outstanding Graduate Student Teaching Award for 2012 – 2013
- Tianyu Ye, The Joseph Hadley Outstanding Advanced Graduate Student Award in Physics & Astronomy - 2014
- Tianyu Ye, Georgia State University's International Student of the Year Award - 2014

Ph.D. Defense Committee of Graduate Students:

- Prabath Hewageegana [2008]: "Theory of electronic and optical properties of nanostructures"
- Saida Caballero-Nieves [2012]: "A study of multiple stars in Cygnus"
- Aruna N. Ramanayaka [2012] : "Magnetotransport in two-dimensional electron systems under microwave excitation and in highly oriented pyrolytic graphite"
- PKD Duleepa Pitigala [2013]: "p-GaAs/AlGaAs and dye-sensitized heterojunction structures for photon detection applications"
- James Palmer [2014] (Georgia Tech): "Pre-growth structures for high quality epitaxial graphene nanoelectronics grown on silicon carbide" 11/6/2014
- Venkata Chaganti [2015]: "Quantum dots"
- Tianyu Ye [2015]: "Magnetotransport and remote sensing of microwave reflection from two-dimensional electron systems under microwave excitation."
- Han-Chun Liu [2016]: "Polarization rotation study of the microwave induced magnetoresistance oscillations in the GaAs/AlGaAs system"

Post-doctoral Research Associates:

- Dr. B. Kaviraj [GSU 2008-2009, now at CEA-Grenoble, France]
- Dr. Tarek Ghanem [GSU 2009-2010, now in Egypt]
- Dr. Pramod Kumar [GSU, 2010-2012]
- Dr. Muhammad Zahir Iqbal [GSU, 2015-2015]
- Dr. A. Kriisa [GSU, 2015- present]

Informal Undergraduate Advisees and Undergraduate Physics Research Assistants [P=Paid by Research Grant, UP = Unpaid, for academic credit]:

- Joshua Alexander [GSU:2008, P]: "Circuit development for an ac-current source"
- Martin Anquez [GSU:2010, now graduate student at Georgia Tech, P – Fulltime 8 Months]: "Scanning Tunneling Microscopy", "Atomic Force Microscopy"
- Hiren Patel [GSU:2010, graduate student at GSU from Fall 2011, UP, P]: "Electrostatic deposition of graphene" (Summer 2010 project, UP)
- Eric Appiah [GSU:2010-2011, UP, P]: "Photolithographic preparation and dicing of ultrasmall semiconductor Hall bar devices" (Summer 2010 project, UP)
- John Aiken [GSU:2010, graduate student at GSU from Fall 2010, UP]: "Setting up a closed cycle refrigerator for low temperature transport measurements"
- Lamcat Tom Dang [GSU:2010-2012, UP, P]: "Design and construction of a cryogenic cold trap" (Summer 2010 project, UP), "Circuit development for a turbo pump controller" (P)
- Theo Asher [GSU:2010, member of GSU Baseball team, UP,P]: "Setting up a vacuum deposition system" (Summer 2010 project, UP), "Construction of a sample holder" (P)
- Olesya Sitnikova-Sarajlic [GSU:2010-2011, graduate student at GSU from Fall 2011, P]: "Scanning Tunneling Microscope Study of Atomic Steps in Gold Films on Muscovite Mica", "Scanning Electron Microscopy"
- Rami Jacob [GSU:2011, UP]: "Transport measurements with a closed cycle refrigerator"
- Tyler Thompson [GSU:2011-2011, P – GSU Presidential Scholar]: "Setting up a gas flow monitoring system for a thermal annealer"
- Megan Smith [GSU:2011-2011, P]: "Analysis of images obtained by Scanning Tunneling Microscopy"
- Alberto Abreus [GSU:2011-2011, P]: "Vacuum interfaces for high vacuum systems"
- Justin Chastain [GSU: 2011-2012, P – GSU Presidential Scholar]: "Transport measurements with a closed cycle refrigerator"
- Kenny Lee [GSU: 8/2011 – 1/2013, P]: "Power supply for a turbo pump", "Noise reduction in STM," "Exfoliation of graphene"
- Kailani Redding [GSU: 8/2011 – 1/2012, UP]: "Labview program for data acquisition over the RS-232 interface"
- Jennifer Rehm [GSU: 1/2012 – 1/2014, UP, P]: "Etching of thermally annealed copper foils"
- Terence Fisher [GSU: 5/2012 – 9/2012, UP, P]: "Microwave waveguide fabrication"
- Thanh Huynh [GSU: 9/2012 – 12/2012, UP]: "Exfoliation of Bismuth Telluride"
- Alan Cummings [GSU: 9/2012 – 12/2012, UP]: "Scanning Tunneling Microscopy"
- Rishi Kowalski [05/2013- 09/2013, UP]: "Etching of copper foils"
- Wajid Qureshi [GSU: 1/2015 – 8/2015, UP]: "Annealing copper foils"
- Pooja Gade [07/2015 – present, P]: "Exfolication of graphene"

Service:

Recommendation letters to graduate schools [G], internships[I] for physics-major undergraduates:

- Hiren Patel [G]
- Eric Appiah [G]
- Olesya Sitnikova-Sarajlic [G]
- Lamcat Tom Dang [G]
- Kenny Lee [I]
- Alan Cummings [I]

Recommendation letters to graduate students for various awards:

- Aruna N. Ramanayaka
- Olesya Sarajlic
- Tianyu Ye
- Monica Cook

Recommendation letters to professional schools for undergraduate non-physics-majors:

- Keena Segre
- Vinil Sidhpura
- Sharon Oh
- Patricia Omosola
- Bianca Islam
- Hannah Ross Suits
- Bonnie Vo
- Candace Clinton
- Karla Vanderlay
- Ashwini Tiwari
- Anokhi Desai
- Karla Vanderlay
- Willesha Jackson
- Seba Saeb
- Huda Saeb

Recommendation letters on behalf of postdocs/research associates for permanent positions:

- Bhaskar Kaviraj
- Tarek Ghanem
- Pramod Kumar
- Yanfeng Lao
- M-Z Iqbal

Member of MS-level Graduate Student Committees for:

- Yu-Ting You
- Aruna Ramanayaka
- Tianyu (Mark) Ye
- Ganesh Chand
- Prakash Thapa
- Aaron Kelley
- Duleepa Pitigala
- Venkata Chaganti
- Olesya Sarajlic
- Zhou Wang
- Han-chun Liu
- Aaron Kelley

- Kapil Baral
- Monica Cook
- Binuka Gunawardana
- Rasadi Munasinghe
- Tharanga Ranjan
- Beena Meena
- Sajith Withanage
- Rupesh Ghimire
- Kushan Wijewardena

Member of Ph.D.-level Graduate Student Committees for:

- Aruna Ramanayaka
- Prabath Hewageegana
- Ganesh Chand
- Prakash Thapa
- Saida Caballero-Nieves
- Tianyu Ye
- Zhuo Wang
- Han-Chun Liu
- James Palmer (GaTech)
- John Hankinson (GaTech)
- Rasanga Samaraveera
- Rasadi Munasinghe
- Tharanga Ranjan

Reviewer of funding-grant proposals:

- Magnetic heterostructures for novel nanoelectronics [NSF, 2007]
- Electronic and mechanical behaviors of novel suspended low dimensional nanostructures [DOE, 2010]
- Fundamental understanding of energy dissipation in electronics [DOE, 2010]
- Quantum topological properties in two-dimensional electron systems through mesoscopic transport experiments [DOE, 2010]
- Synthesizing 2D electron gas interfaces in complex oxides [DOE, 2010]
- Electron dynamics of low dimensional quantum systems [DOE, 2011]
- Charge density wave in mesoscopic 2-D materials for nanoelectronics [ARO, 2014]
- Stretchable AlGaN/GaN High Electron Mobility Transistors [ARO,2015]

Chairman of Conference Sessions:

- First Epitaxial Graphene Workshop, Apr. 1 -2, 2009, Georgia Institute of Technology. Session: Electronic Transport, Thursday, April 2, 2009. Chair: Ramesh Mani.
- 2009 American Physical Society March Meeting, March 16-20, 2009, Pittsburgh, PA. APS Meeting Session Q23: Quantum Hall effect: Tunneling, High Frequency. Chair: Ramesh Mani.
- 2009 Southeastern Section Meeting of the American Physical Society, Nov. 12, 2009, Atlanta, GA. Session: DC Condensed Matter 1. Chair: Ramesh Mani.
- 2nd International Symposium on the Science and Technology of Epitaxial Graphene (STEG2) at Amelia Island, Florida. Sep. 16, 2010. Session: Landau Levels Imaging. Chair: Ramesh Mani.
- 2011 American Physical Society March Meeting, March 21-25, 2011, Dallas, TX: APS Meeting Session X11: Integer Quantum Hall effect. Chair: Ramesh Mani (as a replacement to the absent, listed chairman).
- International Workshop on Nonequilibrium Phenomena in Complex Quantum Systems (NPCQS2012): Session on ESR and Spin Qubits, April 25, 2012, Okinawa, Japan. Chair: Ramesh Mani.
- 32nd Intl. Conf. On the Physics of Semiconductors – ICPS 2014, Aug. 14, 2014, Austin, TX. Session: Topological Insulator 1 (Invited), Aug. 11, 2014. Chair: Ramesh Mani

- The 8th International Conference on Low Dimensional Structures and Devices "LDSD 2016", Session: Aug. 31, 2016. 11:00am-12:15 pm. Chair: Ramesh Mani

Promotion evaluator:

- Assoc. Prof. to Full Prof. promotion evaluation for Prof. Sergey Vitkalov provided by R. G. Mani at the request of the City University of New York on 3/21/2012

Judge:

- Science Olympiad Regional Tournament on 02/23/2008 in the Towers event
- Science Olympiad Regional Tournament on 02/13/2009 in the Elevated bridge event
- Science Olympiad Regional Tournament on 02//19/2011 in the Towers event
- Georgia State Undergraduate Research Conference on 03/16/2011 in Physical Science/Mathematics
- Science Olympiad Regional Tournament on 02//18/2012 in the Towers event
- Science Olympiad Regional Tournament on 02/18/2013 in the Towers event

Host to external seminar guest speaker:

- Vladimir Privman, Clarkson University, "Mechanisms of synthesis and self-assembly of uniform colloids and nanoparticles", 04/09/2007
- Alexei Marchenkov, Georgia Institute of Technology, "ac-Josephson effect and resonant superconducting transport through vibrating Nb nanowires", 10/2/2007
- Claire Berger, Georgia Institute of Technology, "Growth and transport study of Graphene on SiC substrates", 01/29/2008
- LiYuan Zhang, Georgia Institute of Technology, "Spin-dependent transport in Aluminum grains and Single Debye relaxation in BST (BaSrTiO) nanoparticles", 05/04/2008
- Philip First, Georgia Institute of Technology, "Graphene: A Honeycomb with Buzz", 30/9/2008.
- J. R. Anderson, University of Maryland, College Park, "Quantum Computing Based on Josephson-Junction SQUID Phase Qubits", 09/01/2009
- K. G. Suresh, IIT Mumbai, India. "Magnetism in the martensic scenario", 11/18/2010
- H. Sojoudi, Georgia Institute of Technology, Atlanta, GA. "The Synthesis, Doping, and Characterization of Graphene Films". 12/15/2011
- Z. Jiang, Georgia Institute of Technology, Atlanta, GA. "Landau Level Spectroscopy of Graphene and Graphite." 02/14/2012
- B. Rizal, Boston College, Boston, MA. "Ultrasensitive chemical detection using a nano-coax sensor." 09/26/2014

Attended the Georgia State University Board of Regents/Environmental Protection Agency Summary Meeting on behalf of the Physics & Astronomy Department on 9/25/2009

Wrote a 9-page proposal for Georgia State University's Department of Physics and Astronomy entitled: Laboratory Space Request for a Condensed-Matter-Physics Nanodevice Characterization and Fabrication Facility

Contributed to the Physics Department's GSU- 2CI Proposal in 2010 and 2011.

Member of the Condensed Matter Faculty Search Committee: Spring 2012, Spring 2013, Spring 2014

Member of the Center for Nano-Optics Faculty Search Committee: Summer/Fall 2015

Member of the Physics Educational Research Faculty Search Committee, Spring 2012

Member of the Physics Shop Committee: 2012, 2013, 2014, 2015

Member of Publicity Committee: 2014 [Designed and set-up inaugural newsletter], 2015

Substituted for Dr. Thoms in Modern Physics 1, Phys. 3401 on Thurs. 11/4/2011

Substituted for Dr. Dhamala in Phys. 6710, Functional Neuroimaging on 11/14/2011

Acted as a reviewer for the following journals: Physical Review Letters, Physical Review B, Scientific Reports, Applied Physics Letters, Physica E, Chemistry of Materials, ACS Applied Materials and Interfaces, IEEE Sensors, Sensors & Actuators, IEEE Trans. In Nanotechnology, etc.

Board of Editors for Nature- Scientific Reports

STEVEN TRENT MANSON

Education:

Institution	Degree and Year
Rensselaer Polytechnic Institute	B.S., l96l
Columbia University	M.A., 1963 Ph.D., l966

Experience:

Institution	Position and Years
Columbia University	- Research Assistant, l964-1966
National Bureau of Standards, Atomic Physics Division	- National Academy of Sciences - National Research Council Postdoctoral Research Associate, 1966-1968
Georgia State University	- Assistant Professor, 1968-1971 - Associate Professor, 1971-1976 - Professor, 1976-1984 - Regents Professor, 1984-present

Membership in Societies (Professional and Honorary): American Physical Society (Fellow); American Physical Society, Southeastern Section; American Physical Society, Division of Atomic, Molecular and Optical Physics; Sigma Pi Sigma; Phi Beta Delta

Research Funding (Present): National Science Foundation, US Department of Energy, Academy of Applied Sciences

PUBLICATIONS: (updated 012/31/16)

l. "Calculation of Autoionizing Rates," S. T. Manson, Phys. Rev. **145**, 35-40 (1966).

2. "Autoionization Rates of N^{4+} and O^{5+} in the 1s, 2s, 2p $^4P_{5/2}$ State," S. T. Manson, Phys. Letters **31A**, 23-24 (1966).

3. "Zeeman Quenching of the (1s, 2s, 2p) $^4P_{5/2}$ State in Lithium," P. Feldman, M. Levitt, S. T. Manson, R. Novick, and G. Sprott, Physica **33**, 278-279 (1967).

4. "Photoionization in the Soft X-Ray Range: Z-Dependence in a Central Potential Model," S. T. Manson and J. W. Cooper, Phys. Rev. **165**, 126-138 (1968).

5. "Photo-Ionization in the Soft X-Ray Range: Angular Distributions of Photoelectrons and Interpretation in Terms of Subshell Structure," J. W. Cooper, and S. T. Manson, Phys. Rev. **177**, 157-163 (1969).

6. "Dependence of the Phase Shift on Energy and Atomic Number for Electron Scattering by Atomic Fields," S. T. Manson, Phys. Rev. **182**, 97-103 (1969).

7. "Minima of Generalized Oscillator Strengths for Continuum Transitions in Sodium and Potassium," S. T. Manson, *VI ICPEAC Abstracts of Papers* (M.I.T. Press, Boston, Mass., 1969), pp. 626-627.

8. "Angular Distribution of Photoelectrons: Outer Shells of Noble Gases," S. T. Manson and J. W. Cooper, Phys. Rev. A **2**, 2170-2171 (1970).

9. "Angular Distribution of Photoelectrons in Argon and Xenon," S. T. Manson and D. J. Kennedy, Chem. Phys. Letters **7**, 387-389 (1970).

10. "Theoretical Considerations for Autoionizing States with Microsecond Lifetimes," S. T. Manson, Phys. Rev. A **3**, 147-153 (1971).

11. "Oscillations in the Energy Dependence of the Angular Distribution of Photoelectrons," S. T. Manson, Phys. Rev. Letters **26**, 219-220 (197l).

12. "Minima in Atomic Continuum Generalized Oscillator Strengths," S. T. Manson, Phys. Rev. A **3**, 1260-1267 (1971).

13. "Ionization of the L-Shell of Aluminum by Fast Charged Particles," S. T. Manson, Phys. Letters **35A**, 89-91 (1971).

14. "Delayed Maxima in the Ionization of Atomic L-Shells by Fast Charged Particles," S. T. Manson, *VII ICPEAC Abstracts of Papers* (North-Holland Publ. Co., Amsterdam, 197l), pp. 765-766.

15. "Photoionization of the Noble Gases: Cross Sections and Angular Distributions," D. J. Kennedy and S. T. Manson, Phys. Rev. A **5**, 227-247 (1972).

16. "Theoretical Study of Generalized Strengths in Atoms: Comparison with Experiment and other Calculations," S. T. Manson, Phys. Rev. A **5**, 668-677 (1972).

17. "Photoionization of Positive Ions of Atomic Oxygen," D. W. Missavage and S. T. Manson, Phys. Letters **38A**, 85-86 (1972).

18. "Calculations of the Energy Dependence of the Angular Distribution of Photoelectrons from Atomic Oxygen," D. J. Kennedy and S. T. Manson, Planet. Space and Sci. **29**, 621-623 (1972).

19. "Inelastic Collisions of Fast Charged Particles with Atoms: Ionization of the Aluminum L-Shell," S. T. Manson, Phys. Rev. A **6**, 1013-1024 (1972).

20. "Angular Distribution of Photoelectrons from the 5d-Subshell of Hg," S. T. Manson, Chem. Phys. Letters **19**, 76-77 (1973).

21. *Proceedings of the International Conference on Inner Shell Ionization Phenomena and Future Applications*, R. W. Fink, S. T. Manson, J. M. Palms, and R. V. Rao, eds., U. S. AEC, Oak Ridge, TN, 4 volumes, 2384 pages, (1973).

22. "Dependence of the Angular Distribution of Atomic Photoelectrons on Energy and Z. I. p-Subshells," S. T. Manson, J. Electron Spectrosc. **1**, 413-438 (1973).

23. "Angular Distribution of Photoelectrons from Outer 2p and 3p Atomic Subshells," S. T. Manson, J. Electron Spectrosc. **2**, 482-484 (1973).

24. "On the Z-Dependence of X-Ray Oscillator Strengths," S. T. Manson and D. J. Kennedy, Phys. Letters **46A**, 423-424 (1974).

25. "On the Unreliability of the Hydrogenic Approximation for Inelastic Collisions of Fast Charged Particles with Atoms: Ionization of Ne by Protons," S. T. Manson and L. H. Toburen, *VIII ICPEAC Abstracts of Papers* (Institute of Physics, Belgrade, 1973), pp. 695-696.

26. "Double Delayed Maxima in the Ionization of Krypton 3d Electrons by Fast Charged Particles," W. D. Nichols, J.E. Purcell, and S. T. Manson, Chem. Phys. Letters **25**, 399-40l (1974).

27. "Photoelectron Angular Distributions as a Probe of Anisotropic Electron-Ion Interactions," D. Dill, S. T. Manson, and A. F. Starace, Phys. Rev. Letters **32**, 971-974 (1974).

28. "Photoelectron Angular Distributions, Cross Sections, and Branching Ratios for Atomic Oxygen," A. F. Starace, S.T. Manson, and D. J. Kennedy, Phys. Rev. A **9**, 2453-2458 (1974).

29. "X-Ray Emission Probabilities," S. T. Manson and D. J. Kennedy, At. Nuc. Data Tables **14**, 111-120 (1974).

30. "Angular Distribution of Photoelectrons from Atomic Oxygen, Nitrogen, and Carbon," S. T. Manson, D. J. Kennedy, A. F. Starace, and D. Dill, Planet. Space Sci. **22**, 1535-1543 (1974).

31. "Photoelectron Angular Distributions for Open-Shell Atoms: A Probe of Anisotropic Electron-Ion Interactions," D. Dill, A. F. Starace, and S. T. Manson, *Vacuum Ultraviolet Radiation Physics* (Viewweg, Braunschweig, W. Germany, 1974), pp. 165-167.

32. "Effect of the Cooper Minimum on Charged Particle Ionization," L. H. Toburen and S. T. Manson, Chem. Phys. Letters **30**, 114-115 (1975).

33. "Angular Distribution of Photoelectrons from the 4f Subshell of Hg," J. S. Shyu and S. T. Manson, Phys. Rev. A **11**, 166-169 (1975).

34. "Effects of Minima in the Generalized Oscillator Strength on the Total Ionization Cross Section," S. T. Manson and A. Msezane, J. Phys. B **8**, L5-7 (1975).

35. "Effects of Anistropic Electron-Ion Interactions in Atomic Photoelectron Angular Distributions," D. Dill, A. F. Starace, and S. T. Manson, Phys. Rev. A **11**, 1596-1606 (1975).

36. "Energy and Angular Distribution of Electrons Ejected from Helium Fast Protons and Electrons: Theory and Experiment," S. T. Manson, L. H. Toburen, D.H. Madison, and N. Stolterfolt, Phys. Rev. A **12**, 60-79 (1975).

37. "New Minima in Photoionization Cross Sections," A. Z. Msezane and S. T. Manson, Phys. Rev. Letters **35**, 364-366 (1975).

38. "Angular Distribution of Photoelectrons from Atomic Selenium and Bromine," S. T. Manson, A. F. Starace, and D. Dill, *IX ICPEAC Abstracts of Papers* (Univ. of Washington Press, Seattle, WA, 1975), pp. 569-570.

39. "Dependence of Electron-Scattering Phase Shifts and of Photoabsorption Cross Sections on Both Atomic Number and Ionic Charge of Atomic Ions," S. T. Manson, J. L. Dehmer, U. Fano, M. Inokuti, and C. E. Theodosiou, *IX ICPEAC Abstracts of Papers* (Univ. of Washington Press, Seattle, WA, 1975), pp. 693-694.

40. "Energy and Angular Distribution of Electrons Ejected from Ar by l-Mev Proton Impact Ionization: Theory and Experiment," S. T. Manson and L. H. Toburen, *IX ICPEAC Abstracts of Papers*, (Univ. of Washington Press, Seattle, WA, 1975), pp. 751-752.

41. "Photoionization of Positive Ions: The Mercury Iso-electronic Sequence," A. Z. Msezane and S. T. Manson, *IX ICPEAC Abstracts of Papers*, (Univ. of Washington Press, Seattle, WA, 1975), pp. 1185-1186.

42. "Relative Intensities in Photoelectron Spectroscopy of Atoms and Molecules," R. F. Reilman, A. Z. Msezane, and S. T. Manson, J. Electron Spectrosc. **8**, 389-394 (1976).

43. "Satellite Lines in Photoelectron Spectra," S. T. Manson, J. Electron Spectrosc. **9**, 21-28 (1976).

44. "Effects of Anisotropic Electron-Ion Interaction on the Photoelectron Angular Distribution of Open-Shell Atoms," D. Dill, A. F. Starace, and S. T. Manson in *Electron and Photon Interactions with Atoms*, eds. H. Kleinpoppen and M. R. C. McDowell (Plenum Press, NY, 1976), pp. 83-88.

45. "Spectral and Electron Collision Properties of Atomic Ions," K. D. Chao, J. L. Dehmer, U. Fano, M. Inokuti, S. T. Manson, A. Msezane, R. F. Reilman, and C. E. Theodosiou, in *Beam-Foil Spectroscopy*, eds. I.A. Sellin and D. Pegg (Plenum Press, NY, 1976), pp. 637-64l.

46. "Atomic Photoelectron Spectroscopy, Part I," S. T. Manson, Advances in Electronics and Electron Physics 41, 73-111 (1976).

47. "Photoionization of Positive Ions: Outer p-Subshells of the Noble-Gases Isoelectronic Sequence," A. Msezane, R. F. Reilman, S. T. Manson, J. R. Swanson, and L. Armstrong, Jr., Phys. Rev. A **15**, 668-674 (l977).

48. "Photoionization of Positive Ions. I. Oxygen," D. W. Missavage, S. T. Manson, and G. R. Daum, Phys. Rev. A **15**, 1001-1005 (1977).

49. "Further Comments on Atomic Central-Potential Models," S. T. Manson and J. E. Purcell, Phys. Rev. A **15**, 1319-1321 (1977).

50. "Photoelectron Angular Distributions of s Electrons in Open-Shell Atoms," A. F. Starace, R. H. Rast, and S. T. Manson, Phys. Rev. Letters **38**, 1522-1525 (1977).

51. "Energy Distribution of Secondary Electrons Ejected from Krypton by Proton Impact Ionization," S. T. Manson and L. H. Toburen and Y. K. Kim, *X ICPEAC Abstracts of Papers*, (Commissariat a L'Energie Atomique, Paris, 1977), pp. 988-989.

52. "Energy and Angular Distribution of Electrons Ejected from Kr by 1 MeV Proton Impact Ionization: Theory and Experiment," S. T. Manson and L. H. Toburen, *X ICPEAC Abstracts of Papers*, (Commissariat a L'Energie Atomique, Paris, 1977), pp. 990-991.

53. "Angular Distribution of Cl 3s→εp Photoelectrons: Direct Evidence for Anistropic Final State Interactions," A. F. Starace, S. T. Manson, and R. H. Rast, *X ICPEAC Abstracts of Papers*, (Commissariat a L'Energie Atomique, Paris, 1977), pp. 1196-1197.

54. "Relativistic Calculations of Photoionization Cross Sections of Positive Ions," S. T. Manson and W. Ong, *X ICPEAC Abstracts of Papers*, (Commissariat a L'Energie Atomique, Paris, 1977), pp. 1198-1199.

55. "Atomic Photoelectron Spectroscopy, Part II," S. T. Manson, Advances in Electronics and Electron Physics **44**, 1-32 (1977).

56. "Cross Sections for Excitation and Ionization in e-He ($2^{1,3}$S) Collisions," D. Ton-That, S. T. Manson, and M. R. Flannery, J. Phys. B **10**, 62l-635 (1977).

57. "Energy Distributions of Secondary Electrons. III. Projectile Energy Dependence for Ionization of He, Ne, and Ar by Protons," L. H. Toburen, S. T. Manson, and Y. K. Kim, Phys. Rev. A **17**, 148-159 (1978).

58. "The Photoelectron Angular Distribution of Xenon 5s," W. Ong and S. T. Manson, J. Phys. B **11**, L65-L67 (1978).

59. "Anisotropic Effects in the Angular Distribution of Photoelectrons from Cesium 6s," W. Ong and S. T. Manson, Phys. Letters **66A**, 17-18 (1978).

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392. “Coherence of Auger and inter-Coulombic decay processes in the photoionization of $Ar@C_{60}$ versus $Kr@C_{60}$,” M. Magrakvelidze, Ruma De, M. H. Javani, M. E. Madjet, S. T. Manson, and H. S. Chakraborty, Eur. Phys. J. D **70**, 96-1-7 (2016).

393. “Correlation Study of Endohedrally Confined Alkali Earth Atoms ($A@C_{60}$),” M. F. Hasoğlu, H.-L. Zhou, and S. T. Manson, Phys. Rev. A **93**, 022512-1-5 (2016).

394. “First prediction of inter-Coulombic decay of C_{60} inner vacancies through the continuum of confined atoms,” R. De, M. Magrakvelidze, M. E. Madjet, S. T. Manson and H. S. Chakraborty, J. Phys. B **49**, 11LT01-1-5 (2016).

395. “Wigner photoemission time delays from endohedral anions,” A. Kumar, H. R. Varma, P. C. Deshmukh, S. T. Manson, V. K. Dolmatov and A. S. Kheifets, Phys. Rev. A **94**, 043401-1-9 (2016).

396. “Relativistic calculations of angular dependent photoemission time delay,” A. Kheifets, A. Mandal, P. C. Deshmukh, V. K. Dolmatov, D. A. Keating and S. T. Manson, Phys. Rev. A **94**, 013423-1-7 (2016).

397. “Wigner time delay and spin-orbit-activated confinement resonances,” D. A. Keating, P. C. Deshmukh and S. T. Manson, Phys. Rev. A (submitted).

398. “Photoionization of atomic barium subshells in the 4*d* threshold region using the relativistic multi-configuration Tamm-Dancoff approximation,” Aarthi Ganesan, P. C. Deshmukh, and S. T. Manson, Phys. Rev. A (submitted).

PAPERS PRESENTED AT PROFESSIONAL MEETINGS: (updated 12/30/16)

l. "Zeeman Quenching of the (1s, 2s, 2p) $^4P_{5/2}$ State in Lithium," Zeeman Centennial Conference, Amsterdam, Netherlands, Sept., 1965.

2. "Calculation of Autoionization Rates," American Physical Society, New York, NY, Jan., 1966.

3. "Electron Scattering Phase Shifts in Atomic Hartree-Fock- Slater Potentials," Southeastern Section of the American Physical Society, Athens, GA, Oct., 1968.

4. "Generalized Oscillator Strengths for Continuum States in Sodium," American Physical Society, Washington, DC, April, 1969.

5. "Minima of Generalized Oscillator Strengths for Continuum Transitions in Sodium and Potassium," VI International Conference on the Physics of Electronic and Atomic Collisions, Boston, MA, July, 1969.

6. "Outer Shell Ionization of Argon by Electron Impact: Angular Distributions in a Central Potential Model," Gaseous Electronics Conference, Gatlinburg, TN, Nov., 1969.

7. "Inelastic Scattering Form Factors for L-Shells in Al and Si," American Physical Society, Washington, DC, April, 1970.

8. "Charged Particle Ionization of the Neon L-Shell," American Physical Society, New Orleans, LA, Dec., 1970.

9. "Angular Distribution of Noble Gas Photoelectrons," American Physical Society, Washington, DC, April, 1971.

10. "Photoionization of Positive Ions of Atomic Oxygen," Southeastern Section of the American Physical Society, Columbia, SC, Nov., 1971.

11. "Photoionization of 2s and 2p Subshells of Positive Ions of Atomic Oxygen," American Physical Society, Washington, DC, April, 1972.

12. "Crucial Experiments in Atomic Photoelectron Spectroscopy," Gaseous Electronics Conference, London, Ontario, Oct., 1972 (invited paper).

13. "Angular Distribution of Atomic Photoelectrons," Southeastern Section of the American Physical Society, Birmingham, AL, Nov., 1972 (invited paper).

14. "Angular Distribution of Photoelectrons from Outer p-Subshells of Atoms," American Physical Society, Washington, DC, April, 1973.

15. "Inelastic Collisions of Fast Charged Particles with Atoms: Studies of the Asymptotic Energy Loss Cross Section," American Physical Society, Washington, DC, April, 1973.

16. "Angular Distribution of Electrons Ionized by Fast Charged Particles in He and Ne," Division of Electron and Atomic Physics, American Physical Society, New Haven, CT, Dec., 1973.

17. "Effect of Correlation on Photoelectron Angular Distributions," Division of Electron and Atomic Physics, American Physical Society, New Haven, CT, Dec., 1973.

18. "Angular Distribution of Atomic Photoelectrons," American Physical Society, Washington, DC, April, 1974 (invited paper).

19. "Ion-Electron Interactions in Photoionization," International Conference on Positive Ion Interactions, Boulder, CO, July, 1974 (invited paper).

20. "Theoretical Photoelectron Studies," Gordon Research Conference on X-Ray Photoelectron Spectroscopy, Wolfboro, NH, July, 1974 (invited paper).

21. "Energy Distribution of Electrons Ejected from He, Ne, and Ar by 1-Mev Proton Impact," Division of Electron and Atomic Physics, American Physical Society, Chicago, IL, Dec. 1974.

22. "Angular Distribution of Photoelectrons from Halogen Atoms," American Physical Society, Division of Electron and Atomic Physics, Chicago, IL, Dec., 1974.

23. "Ionization of Krypton 3d Electrons by Fast Charged Particles," American Physical Society, Atlanta, GA, Dec., 1974.

24. "Angular Distribution of Photoelectrons from the 4f Subshell of Hg," American Physical Society, Atlanta, GA, Dec., l974.

25. "Minima in Total Ionization Cross Sections as a Result of Minima in Generalized Oscillator Strengths," American Physical Society, Washington, DC, April, 1975.

26. "Angular Distribution of Photoelectrons from Atomic Selenium and Bromine," IX International Conference on the Physics of Electronic and Electronic Collisions, Seattle, WA, July, 1975.

27. "Dependence of Electron-Scattering Phase Shifts and of Photoabsorption Cross Sections on Both Atomic Number and Ionic Charge for Atomic Ions," IX International Conference on the Physics of Electronic and Atomic Collisions, Seattle, WA, July, 1975.

28. "Energy and Angular Distribution of Electrons Ejected from Ar by 1-Mev Proton Impact Ionization: Theory and Experiment," IX International Conference on the Physics of Electronic and Atomic Collisions, Seattle, WA, July 1975.

29. "Spectral and Electron Collision Properties of Atomic Ions, Fourth International Conference on Beam-Foil Spectroscopy, Gatlinburg, TN, Sept. 1975.

30. "Energy and Angular Distribution of Electrons Ejected from the Noble Gases by Proton Impact Ionization," Fourth International Conference on Beam-Foil Spectroscopy, Gatlinburg, TN, Sept., 1975.

31. "Multiple Minima in Oscillator Strength Distributions of Excited Atomic States," Division of Electron and Atomic Physics, American Physical Society, Tucson, AZ, Dec., 1975.

32. "Photoionization of Positive Ions: The Xenon Isoelectronic Sequence," Division of Electron and Atomic Physics of the American Physical Society, Tucson, AZ, Dec., 1975.

33. "Photoionization of Positive Ions of Atomic Mercury," Southeastern Section of the American Physical Society, Auburn, AL, Nov., 1975.

34. "Ionization of Atoms by Fast Charged Particles," Southeastern Section of the American Physical Society, Auburn, AL, Nov., 1975 (invited paper).

35. "Photoionization of the Argon Isoelectronic Sequence," American Physical Society, Washington, DC, April, 1976.

36. "Photoelectron Distributions of Open-Shell Atoms: Tellurium and Iodine," V International Conference on Atomic Physics, Berkeley, CA, July, 1976.

37. "Impact Ionization of Noble Gas Atoms," Division of Electron and Atomic Physics, American Physical Society, Lincoln, NE, Dec., 1976.

38. "Photoionization of Positive Ions," Topical Conference on Atomic Processes in High Temperature Plasmas, Knoxville, TN, Feb., 1977.

39. "Relativistic Effects in Low Energy Photoionization Cross Sections," American Physical Society, Washington, DC, April, 1977.

40. "Inner Shell Properties of Atomic Ions," Division of Electron and Atomic Physics, American Physical Society, Knoxville, TN, Dec., 1977.

41. "Energy Distribution of Secondary Electrons Ejected from Krypton by Proton Impact Ionization," X International Conference on the Physics of Electronic and Atomic Collisions, Paris, France, July, 1977.

42. "Energy and Angular Distribution of Electrons Ejected from Kr by l MeV Proton Impact Ionization: Theory and Experiment," X International Conference on the Physics of Electronic and Atomic Collisions, Paris, France, July, 1977.

43. "Angular Distribution of C1 3s→εp Photoelectrons: Direct Evidence for Anisotropic Final State Interactions," X International Conference on the Physics of Electronic and Atomic Collisions, Paris, France, July, 1977.

44. "Relativistic Calculations of Photoionization Cross Sections of Positive Ions," X International Conference on the Physics of Electronic and Atomic Collisions, Paris, France, July, 1977.

45. "Energy and Angular Distribution of Secondary Electrons: Dependence of Calculated Results on Atomic Wave Functions," American Physical Society, Washington, DC, April, 1978.

46. "Dirac-Slater Calculations of Ionic Photoabsorption," American Physical Society, Washington, DC, April, 1978.

47. "Energy Dependence of Photoelectron Branching Ratios," American Physical Society, Washington, DC, April, 1978.

48. "Angular Distribution of Photoelectrons from the Outer ns Subshell of Alkali Atoms," American Physical Society, Washington, DC, April, 1978.

49. "Core Photoemission in Solids: An Atomic View," International Workshop on Photoionization, Paris, France, June, 1978 (invited paper).

50. "Multiple Minima in Photoionization Cross Sections," Division of Electron and Atomic Physics, American Physical Society, Madison, WI, Dec., 1978.

51. "Dirac-Slater Calculations of the Photoionization of Heavy Elements," Division of Electron and Atomic Physics, American Physical Society, Madison, WI, Dec., 1978.

52. "Generalized Oscillator Strengths for Ionization of the K and L Inner Shells of Atoms," Division of Electron and Atomic Physics, American Physical Society, Madison, WI, Dec., 1978.

53. "Relativistic Calculations of the Photoionization of Highly Stripped Ions," Topical Conference on Atomic Processes in Plasmas, Boulder, CO, Jan., 1979.

54. "Spectral and Collision Properties of Atomic Ions," U.S.-Japan Seminar on Plasma Spectroscopy, Kyoto, Japan, May, 1979 (invited paper).

55. "Photoionization of Chalcogen and Halogen Atoms: Cross Sections and Angular Distributions," XI International Conference on the Physics of Atomic and Electronic Collisions, Tokyo, Japan, July, 1979.

56. "Differential Cross Sections for Ionization of Krypton by Fast Protons: Theory and Experiment," XI International Conference on the Physics of Atomic and Electronic Collisions, Tokyo, Japan, July, 1979.

57. "Generalized Oscillator Strengths for Ionization of the K and L Inner Shells of Atoms. II," Division of Electron and Atomic Physics, American Physical Society, Houston, TX, Dec., 1979.

58. "Photoelectron Angular Distributions for s^2p^n Open-Shell Atoms: s-Electron Photoionization," Division of Electron and Atomic Physics, American Physical Society, Houston, TX, Dec., 1979.

59. "Calculation of Photoelectron Branching Ratios of 4d and 5d Orbitals," Division of Electron and Atomic Physics, American Physical Society, Houston, TX, Dec., 1979.

60. "Screening Effects of Projectile Electrons on the Secondary Electron Distributions from Ion Impact Ionization of Atoms: Theory and Experiment for He^+ + He," Division of Electron and Atomic Physics, American Physical Society, Houston, TX, Dec., 1979.

61. "Simple Photoionization Calculations," Workshop on Atomic Data Needs in Astrophysics, Baltimore, MD, March, 1980 (invited paper).

62. "Branching Ratios in the Photoionization of 4d and 5d States in Atoms," VI International Conference on Vacuum Ultraviolet Radiation Physics, Charlottesville, VA, June, 1980.

63. "Inner-Shell Threshold Effects in Photoionization," Gordon Conference on Electron Spectroscopy, Wolfboro, NH, July, 1980.

64. "Near Threshold Structure in the Atomic K-Shell Spectra for Ionization by Photons or Fast Charged Particles," XI International Conference on X-Ray Processes and Inner-Shell Ionization, Stirling, Scotland, Aug., 1980.

65. "Novel Synchrotron Experiments," Workshop on Synchrotron Atomic Physics, Brookhaven National Laboratory, Sept., 1980 (invited paper).

66. "Calculation of Double Differential Cross Sections for Proton and Electron Impact Ionization of Atoms," Conference on the Application of Accelerators in Research and Industry, Denton, TX, Nov., 1980 (invited paper).

67. "Bethe-Born Approximation for the Energy Distribution of Electrons Ejected from Neon by Proton Impact," Division of Electron and Atomic Physics, American Physical Society, Los Angeles, CA, Dec., 1980.

68. "Double Differential Cross Sections for He^+ + He: Theory and Experiment," Division of Electron and Atomic Physics, the American Physical Society, Los Angeles, CA, Dec., 1980.

69. "Analytic Representation of the Generalized Oscillator Strength for Atomic Inner-Shell Ionization," Division of Electron and Atomic Physics, American Physical Society, Los Angeles, CA, Dec., 1980.

70. "Multiple Minima in the Photoionization Cross Section for Cs^* 5d: Hartree-Fock Calculations," Division of Electron and Atomic Physics, American Physical Society, Los Angeles, CA, Dec., 1980.

71. "Photoionization Cross Sections for High-Z Atoms: Relativistic Effects," Division of Electron and Atomic Physics, American Physical Society, Los Angeles, CA, Dec., 1980.

72. "Photoionization and Photoexcitation of Excited States of the Alkali Atoms," Division of Electron and Atomic Physics, American Physical Society, Los Angeles, CA, Dec., 1980.

73. "Photoionization of the $4d^{10}$ Subshell of Cadmium," Division of Electron and Atomic Physics, American Physical Society, Los Angeles, CA, Dec., 1980.

74. "Structure in K-Shell Ionization by Photons and Fast Charged Particles," Division of Electron and Atomic Physics, American Physical Society, Los Angeles, CA, Dec., 1980.

75. "Cooper Minima in Photoionization of Heavy Elements: Relativistic Effects," Division of Electron and Atomic Physics, American Physical Society, Los Angeles, CA, Dec., 1980.

76. "Photoionization of Excited Alkali Atoms," Symposium on Photoionization of Excited Atoms, Boulder, CO, March, 1981 (invited paper).

77. "Theory of Sub-keV Photoionization Cross Sections," Conference on Low-Energy X-Ray Diagnostics, Monterey, CA, June, 1981 (invited paper).

78. "Hartree-Fock Calculations of the Photoionization of Excited Atomic States," XII International Conference on the Physics of Electronic and Atomic Collisions, Gatlinburg, TN, July, 1981.

79. "Photoionization and Photoexcitation of Excited States of the Alkali Atoms," XII International Conference on the Physics of Electronic and Atomic Collisions, Gatlinburg, TN, July, 1981.

80. "Photoionization of 4f and 5d Subshells of High-Z Elements," XII International Conference on the Physics of Electronic and Atomic Collisions, Gatlinburg, TN, July, 1981.

81. "Z-Dependence of Minima in Photoionization Cross Sections: Non-Relativistic Results," XII International Conference on the Physics of Electronic and Atomic Collisions, Gatlinburg, TN, July, 1981.

82. "Cancellation of Relativistic, Retardation, and Higher Multipole Effects in Inner Shell Photoionization Cross Section," XII International Conference on the Physics of Electronic and Atomic Collisions, Gatlinburg, TN, July, 1981.

83. "Relativistic Effects on Minima in Photoionization Cross Sections of High-Z Elements," XII International Conference on the Physics of Electronic and Atomic Collisions, Gatlinburg, TN, July, 1981.

84. "Theoretical and Experimental Study of the Energy and Angular Distribution of Electrons Ejected in He^+ + He Collisions," XII International Conference on the Physics of Electronic and Atomic Collisions, Gatlinburg, TN, July, 1981.

85. "Trajectory of Cooper Minima for 5d Subshells," Division of Electron and Atomic Physics, American Physical Society, New York, NY, Dec., 1981.

86. "Existence of Three Zeroes in the Cs 9d 6,f Photoionization Channel," Division of Electron and Atomic Physics, American Physical Society, New York, NY, Dec., 1981.

87. "Systematics of the Photoionization of the 6p Subshell for High-Z Elements," Division of Electron and Atomic Physics, American Physical Society, New York, NY, Dec., 1981.

88. "Projectile Ionization in Ion-Atom Collisions," Division of Electron and Atomic Physics, American Physical Society, New York, NY, Dec., 1981.

89. "Secondary Electron Emission in H^+ + Ne Collisions," Division of Electron and Atomic Physics, American Physical Society, New York, NY, Dec., 1981.

90. "Photoionization of Mg: RRPA Calculations," American Physical Society, Washington, DC, April, 1982.

91. "The Theoretical Basis for the Calculation of the Production and Decay of Inner Shell Vacancies," XII International Conference on X-Rays and Inner Shell Ionization Phenomena, Eugene, OR, July, 1982 (invited paper).

92. "Production of Multiply Charged Krypton by Fast Proton Impact," XII International Conference on X-Rays and Inner Shell Ionization Phenomena, Eugene, OR, July, 1982.

93. "Cross Section for Inelastic Scattering of Electrons with Atoms-Topics Related to Electron Microscopy," Pfefferkorn Conference, Chicago, IL, July, 1982 (invited paper).

94. "Discrete Oscillator Strength Distributions in the Alkali Atoms," Division of Electron and Atomic Physics, American Physical Society, Boulder, CO, May, 1983.

95. "Angular Momentum Dependence of the Suppression of Relativistic Effects in Total Cross-Sections for Radiative Transitions," Division of Electron and Atomic Physics, American Physical Society, Boulder, CO, May, 1983.

96. "Mechanisms for Production of Multi-charged Ions by Proton Impact Ionization of Neon," Division of Electron and Atomic Physics, American Physical Society, Boulder, CO, May, 1983.

97. "Photoionization of the 5p Subshell in Hg," Division of Electron and Atomic Physics, American Physical Society, Boulder, CO, May, 1983.

98. "Photoionization of the 6p Subshell of Rn: RRPA Calculations," Division of Electron and Atomic Physics, American Physical Society, Boulder, CO, May, 1983.

99. "Photoionization of Na and K 3d Subshells: An Investigation of the Zeros in the *l6l-1* Dipole Matrix Element," Division of Electron and Atomic Physics, American Physical Society, Boulder, CO, May, 1983.

100. "Inelastic Corrections to the Bethe Stopping Power Formula Evaluated from a Realistic Atomic Model," VII International Congress on Radiation Research, Amsterdam, Netherlands, July, 1983.

101. "Zeros in Dipole Matrix Elements of Photoionization of Excited Alkali Atoms," XIII International Conference on the Physics of Electronic and Atomic Collisions, Berlin, Germany, July, 1983.

102. "Cross Sections for the Photoionization of Excited d-States of Alkali Atoms: Hartree-Fock Calculations," XIII International Conference on the Physics of Electronic and Atomic Collisions, Berlin, Germany, July, 1983.

103. "Photoionization of High-Z Atoms: Relativistic Effects on Cooper Minima in the 6p Subshell," XIII International Conference on the Physics of Electronic and Atomic Collisions, Berlin, Germany, July, 1983.

104. "*Znl* Dependence of Cancellation of Relativistic and Retardation Effects in Photoionization," XIII International Conference on the Physics of Electronic and Atomic Collisions, Berlin, Germany, July, 1983.

105. "Relativistic Effects in the Photoionization of the 5p Subshell in High-Z Elements," XIII International Conference on the Physics of Electronic and Atomic Collisions, Berlin, Germany, July, 1983.

106. "Relativistic Study of Multichannel Interactions in Photoionization of High-Z Atoms: RRPA Applied to Radium and Radon," XIII International Conference on the Physics of Electronic and Atomic Collisions, Berlin, Germany, July, 1983.

107. "How Do We Decide Whether the First Born Approximation Applies to Inelastic Collisions of Charged Particles with an Atom or Molecule," XIII International

Conference on the Physics of Electronic and Atomic Collisions, Berlin, Germany, July, 1983.

108. "Double Ionization Mechanisms in H^+ + Ne Collisions," XIII International Conference on the Physics of Electronic and Atomic Collisions, Berlin, Germany, July, 1983.

109. "Recent Progress and Problems in the Theory of VUV Photoionization of Atoms," VII International Conference of Vacuum Ultraviolet Radiation Physics, Jerusalem, Israel, Aug., 1983 (invited paper).

110. "Photoionization of Excited f-States in Atoms," Southeastern Section of the American Physical Society, Columbia, SC, Nov., 1983.

111. "Electron Ejection Cross Sections in Electron and Ion Impact Ionization of Atoms and Molecules: *Ab Initio* and Semiempirical Calculations," Workshop on Electronic and Ionic Collision Cross Sections, Argonne, IL, Dec., 1983 (invited paper).

112. "What's Next: Theory," Workshop on New Directions in Soft X-Ray Photoabsorption, Pacific Grove, CA, April, 1984 (invited paper).

113. "Differential Cross Sections for Ionization of Methane, Ammonia, and Water Vapor by High Velocity Ions," Division of Electron and Atomic Physics, American Physical Society, Storrs, CT, May, 1984.

114. "Multiple Ionization Mechanisms in Proton-Atom Collisions," Division of Electron and Atomic Physics, American Physical Society, Storrs, CT, May, 1984.

115. "Inner Shell Contribution to Multiple Ionization in Ion-Atom Collisions," XIII International Conference on X-Rays and Inner Shell Ionization Phenomena, Leipzig, Germany, Aug. 1984 (invited paper).

116. "Photoelectron Angular Distributions of Inner d- and f-shells of Atoms," XIII International Conference on X-Rays and Inner Shell Ionization Phenomena, Leipzig, Germany, Aug., 1984.

117. "Theoretical Studies of Electron Emission in Ion-Atom Collisions: Bare and Structured Particles," II Workshop on High Energy Ion-Atom Collision Processes, Debrecen, Hungary, Aug., 1984 (invited talk).

118. "Atomic and Molecular Physics with VUV and X-Ray Photons," CAMS Workshop on VUV and X-Ray Sources, Washington, DC, Nov., 1984 (invited talk).

119. "Photoionization of Na 3p," Division of Electronic and Atomic Physics, American Physical Society, Norman, OK, May, 1985.

120. "Differential Cross-Sections for Ionization of Water by Fast Electrons," Division of Electronic and Atomic Physics, American Physical Society, Norman, OK, May, 1985.

121. "Threshold Effects in Inner-Shell Photoionization of Open-Shell Atoms: Hartree-Fock Calculations," XIV International Conference on the Physics of Electronic and Atomic Collisions, Palo Alto, CA, July, 1985.

122. "Photoionization of the Excited Na 4d State," XIV International Conference on the Physics of Electronic and Atomic Collisions, Palo Alto, CA, July, 1985.

123. "Relativistic Calculations of the Photoionization of 6s Subshells in High-Z Atoms," XIV International Conference on the Physics of Electronic and Atomic Collisions, Palo Alto, CA, July, 1985.

124. "Electron Ejection in He^+-He Collisions," XIV International Conference on the Physics of Electronic and Atomic Collisions, Palo Alto, CA, July, 1985.

125. "Electron Ejection in Ion-Atom Collisions: Bethe-Born Theory for Structured Incident Ions," XIV International Conference on the Physics of Electronic and Atomic Collisions, Palo Alto, CA, July, 1985.

126. "Photoionization as a Sensitive Probe of Unusual States of Atoms and Molecules," Workshop on an Advanced Synchrotron Light Source, Berkeley, CA, Nov., 1985 (invited talk).

127. "Theoretical Studies of Structured-Ion-Atom Collisions," IV Australian Conference on Atomic and Molecular Physics and Quantum Chemistry, Hobart, Tasmania, Jan., 1986.

128. "Relativistic Effects in the Photoionization of Heavy Atoms: Cooper Minima," Workshop on Excited and Ionized States of Atoms and Molecules, Strathgordon, Tasmania, Feb., 1986 (invited talk).

129. "Photoionization of Unusual States of Matter: Atomic Ions, Excited States, and Open-Shell Atoms," Workshop on Excited and Ionized States of Atoms and Molecules, Strathgordon, Tasmania, Feb., 1986 (invited talk).

130. "Anomalous 3s Multiplet Ratios in Transition Metal Ions: A Breakdown of the Sudden Approximation?" American Physical Society, Las Vegas, NV, Mar., 1986.

131. "Photoionization of Aluminum," Division of Atomic, Molecular and Optical Physics, American Physical Society, Eugene, OR, June, 1986.

132. "Photoionization of Excited States of Ions: Cesium Isoelectronic Sequence," Division of Atomic, Molecular and Optical Physics, American Physical Society, Eugene, OR, June, 1986.

133. "Systematics of Energy Levels and Other Properties of Highly Charged Ions," International Seminar on Dynamic Processes of Highly Charged Ions, Fuji, Japan, Aug., 1986 (invited talk).

134. "Cancellation of Relativistic, Retardation and Higher Multipole Effects in Photoeffect," X International Conference on Atomic Physics, Tokyo, Japan, Aug., 1986.

135. "Systematics of Threshold Phase Shifts or Quantum Defects, for Atomic Ions," X International Conference on Atomic Physics, Tokyo, Japan, Aug., 1986.

136. "Atomic Physics on a Synchrotron: Crucial Experiments," Conference on the Application of Accelerators in Research and Industry, Denton, TX, Nov., 1986 (invited talk).

137. "The Promise of a High-Brightness Synchrotron," Workshop on New Directions in Soft X-ray Photoabsorption, Asilomar, CA, March, 1987 (invited talk).

138. "Ab Initio and Semiempirical Calculations of Electron Emission Spectra," Sanibel Symposium, Palm Coast, FL, March, 1987 (invited talk).

139. "Photoionization of 3d, 4s, and 4p Subshells of Gallium," Division of Atomic, Molecular and Optical Physics, American Physical Society, Boston, MA, May, 1987.

140. "Photoionization of Excited nf States of the Cesium Isoelectronic Sequence: A Case of Orbital Collapse," Division of Atomic, Molecular and Optical Physics, American Physical Society, Boston, MA, May, 1987.

141. "Photoionization of Open-Shell Atoms: Non-statistical Inner-Shell Branching Ratios," XV International Conference on the Physics of Electronic and Atomic Collisions, Brighton, England, July, 1987.

142. "Photoionization of Excited f-States of Ions of the Cs and Rb Isoelectronic Sequences," XV International Conference on the Physics of Electronic and Atomic Collisions, Brighton, England, July, 1987.

143. "Multiple Ionization of Xenon by Proton Impact," XIV International Conference on X-Ray and Inner-Shell Processes, Paris, France, September, 1987.

144. "Resonances in Near-Threshold X-Ray Photoabsorption of Inner Shells," XIV International Conference on X-Ray and Inner-Shell Processes, Paris, France, September, 1987.

145. "Photoabsorption and Photoionization Cross Sections: An Overview of Our Current State of Knowledge," SPIE Symposium on Laser Spectroscopy, Los Angeles, CA, January, 1988 (invited talk).

146. "Photoionization of Ions and Excited States," LLNL Workshop on Atomic Processes, Livermore, CA, March, 1988 (invited talk).

147. "Photoionization of K+ Ions," Division of Atomic, Molecular and Optical Physics, American Physical Society, Baltimore, MD, April, 1988.

148. "Photoionization of Al+ Ions: An RRPA Study," Division of Atomic, Molecular and Optical Physics, American Physical Society, Baltimore, MD, April 1988.

149. "Photoionization of Excited nd-States in Rb and Sr+," Division of Atomic, Molecular and Optical Physics, American Physical Society, Baltimore, MD, April, 1988.

150. "Differential Cross Sections for Electron Impact Ionization of Water," Radiation Research Society, Philadelphia, PA, April, 1988.

151. "Theoretical Studies of the Photoionization of Excited States of Ions of the Cesium Isoelectronic Sequence: Ba^{+} to Tb^{10+}," XI International Conference on Atomic Physics, Paris, July, 1988.

152. "Photoionization Cross Sections: Present Status and Future Needs," IV International Symposium on Radiation Physics, Sao Paulo, Brazil, Oct., 1988 (invited talk).

153. "Observations on Excited State Photoionization of Xe," IV International Laser Science Conference, Atlanta, GA, Oct., 1988.

154. "Photoionization of the Excited 3p States of Carbon," Division of Atomic, Molecular and Optical Physics, American Physical Society, Windsor, Canada, May, 1989.

155. "Photoionization of Positive Ions of Magnesium," Division of Atomic, Molecular and Optical Physics, American Physical Society, Windsor, Canada, May, 1989.

156. "Photoionization of Excited States of High-Z Atoms," Division of Atomic, Molecular and Optical Physics, American Physical Society, Windsor, Canada, May, 1989.

157. "Cross Sections and Angular Distributions for Photoionization of Heavy Elements," XVI International Conference of the Physics of Electronic and Atomic Collisions, New York, July, 1989.

158. "Photoionization of Excited States of Carbon," XVI International Conference of the Physics of Electronic and Atomic Collisions, New York, July, 1989.

159. "Studies of Ionic Photoionization: RRPA Calculation of Argon Isoelectronic and Isonuclear Sequences," XVI International Conference on the Physics of Electronic and Atomic Collisions, New York, July, 1989.

160. "Photoionization of Excited States of Argon: Comparison with Potassium," XVI International Conference on the Physics of Electronic and Atomic Collisions, New York, July, 1989.

161. "Electron Emission Resulting from Projectile and Target Ionization in He^+ - Ar Collisions: Experiment and Theory," XVI International Conference on the Physics of Electronic and Atomic Collisions, New York, July, 1989.

162. "Photoionization of Positive Ions: A Review of our Present Understanding," XVI International Conference on the Physics of Electronic and Atomic Collisions, New York, July, 1989 (invited paper).

163. "Energy Dependence of the Outer Core-Level Multiplets in Atomic Mn and Mn-Containing Compounds," Ninth International Conference on Vacuum Ultraviolet Radiation Physics, Honolulu, July, 1989.

164. "Photoionization of 3p Excited States of Nitrogen and Oxygen," American Physical Society, Atlanta, GA, Jan., 1990.

165. "New Frontiers in X-Ray Photoionization of Ions and Atoms" Workshop on Atomic Physics at the Advanced Photon Source, Argonne, IL, March, 1990 (invited paper).

166. "Photoionization of Excited *3l* and *4l* States of Carbon, Nitrogen and Oxygen," Division of Atomic, Molecular and Optical Physics, American Physical Society, Monterey, CA, May, 1990.

167. "Photoionization of Excited 2p3p States of C: Hartree-Fock and R-Matrix Results, Division of Atomic, Molecular and Optical Physics, American Physical Society, Monterey, CA, May, 1990.

168. "Relativistic Effects in Secondary Electron Spectra," Division of Atomic, Molecular and Optical Physics, American Physical Society, Monterey, CA, May, 1990.

169. "Energy Dependence of the Cross Section for Photoionization of Na(12s) Near Threshold, Division of Atomic, Molecular and Optical Physics, American Physical Society, Monterey, CA, May, 1990.

170. "Double Differential Cross Sections for He^+ - Atom/Molecule Collisions: Experiment and Theory," IV Workshop on High-Energy Ion-Atom Collision Processes, Debrecen, Hungary, Sept., 1990 (invited paper).

171. "Photoionization of the 6s6p Excited States of Ytterbium," Southeastern Section of the American Physical Society, Atlanta, GA, Nov., 1990.

172. "Multiconfiguration Hartree-Fock Calculations of the Photoionization of Helium," Southeastern Section of the American Physical Society, Atlanta, GA, Nov., 1990.

173. "Relativistic Studies of Photoionization of High-Z Ions: Resonances below the $2p_{1/2}$ Threshold in Mg - Like Lawrencium," Southeastern Section of the American Physical Society, Atlanta, GA, Nov., 1990.

174. "Photoionization of Excited States of Atoms," Third US-Mexico Workshop on Atomic Physics, Cocoyoc, Mexico, March, 1991 (invited paper).

175. "Photoionization of Na Atoms in the Vicinity of the 2s Thresholds," XVII International Conference on the Physics of Electronic and Atomic Collisions, Brisbane, Australia, July, 1991.

176. "Radiative Recombination and Excited State Photoionization in Lithium," XVII International Conference on the Physics of Electronic and Atomic Collisions, Brisbane, Australia, July 1991.

177. "First Born Calculations for Electron Emission Occurring in H^0 + He Collisions," XVII International Conference on the Physics of Electronic and Atomic Collisions, Brisbane, Australia, July 1991.

178. "Theoretical Studies of Projectile and Target Electron Emission in Fast Ion-Atom Collisions," International Seminar on Ion-Atom Collisions XII, Queensland, Australia, July, 1991 (invited paper).

179. "Photoionization of Rydberg Atoms near Threshold," Workshop on Emission and Absorption of Radiation by Structured Particles, Cambridge, MA, October, 1991 (invited paper).

180. "Dominance of Simultaneous Processes in Energetic H-Atom Collisions," Division of Atomic, Molecular and Optical Physics, American Physical Society, Chicago, IL, May, 1992.

181. "A Study of Autoionization Resonances in Neon and Magnesium Isoelectronic Sequences," Division of Atomic, Molecular and Optical Physics, American Physical Society, Chicago, IL, May, 1992.

182. "Absolute Isotropic Cross Sections for Photoionization of the $6s6p\,^1P$ Excited State of Barium," Division of Atomic, Molecular and Optical Physics, American Physical Society, Chicago, IL, May, 1992.

183. "Photoionization of the $6s6p\,^1P_1$ Excited State of Barium: Measurement of Absolute Cross Sections for Transition to Individual Final States," Division of Atomic, Molecular and Optical Physics, American Physical Society, Chicago, IL, May, 1992.

184. "Radiative Recombination and Photoionization of Excited States of Lithium," Division of Atomic, Molecular and Optical Physics, American Physical Society, Chicago, IL, May, 1992.

185. "Dominance of Two-Electron Transitions in the Photoionization of Inner Shells of Excited Atoms," Division of Atomic, Molecular and Optical Physics, American Physical Society, Chicago, IL, May, 1992.

186. "Calculation of Secondary-Electron Energy Spectra for Electron-Impact Ionization of Multishell Atoms," Division of Atomic, Molecular and Optical Physics, American Physical Society, Chicago, IL, May, 1992.

187. "Photoionization of Sodium in the Ground and Excited States," Division of Atomic, Molecular and Optical Physics, American Physical Society, Chicago, IL, May, 1992.

188. "Absolute Cross Sections for Photoionization of the Excited $6s6p\,^1P$ State of Barium to Specific Final J-States," XIII International Conference on Atomic Physics, Munich, Germany, Aug., 1992.

189. "Photoelectron Angular Distributions: Theoretical Considerations, Physical Interpretation and Results for Atoms," International Workshop on Photoionization, Berlin, Germany, Aug., 1992 (invited paper).

190. "An Introduction to the Theory of Photoelectron Angular Distributions," Workshop on the Application of Many-Body Theory to Atomic Physics, Cambridge, MA, April, 1993 (invited paper).

191. "Photoionization of the $6s6p\ ^1P_1$ Excited State of Barium: Comparison with Theory in the Threshold Region," Division of Atomic, Molecular and Optical Physics, American Physical Society, Reno, NV, May, 1993.

192. "Scaling of Cross Sections in Fast Collisions Between Few Electron Systems," Atomic, Molecular and Optical Physics Division, American Physical Society, Reno, NV, May, 1993.

193. "The Influence of Projectile Electron-Target Electron Interactions on the Electron Emission in Fast Ionizing Collisions," V Workshop on Fast Ion-Atom Collision Processes, Debrecen, Hungary, July, 1993.

194. "Observations on Fast Ion-Atom Collisions: Workshop Summary," V Workshop on Fast Ion-Atom Collision Processes, Debrecen, Hungary, July, 1993 (invited paper).

195. "Photoionization of Ground and Excited States of He and Li Atoms," XVIII International Conference on the Physics of Electron and Atomic Collisions, Aarhus, Denmark, July, 1993.

196. "Photoionization of Ba 6s6p $^1P_1$ 6 6s,P $^{1,3}P_j$: Absolute Cross Sections for Alternative Values of j," XVIII International Conference on the Physics of Electron and Atomic Collisions, Aarhus, Denmark, July, 1993.

197. "Z Scaling in Fast Ionizing Atom-Atom Collisions," XVIII International Conference on the Physics of Electron and Atomic Collisions, Aarhus, Denmark, July, 1993.

198. "Projectile Dependence of Two-Center Electron-Electron Interactions in Few-Electron Collision Systems," International Seminar on Ion-Atom Collisions, Stockholm, Sweden, July, 1993 (invited paper).

199. "The Ratio of Double to Single Ionization in Helium: The Relationship of Photon and Bare Charged particle Impact Ionization," Workshop on Double Photoionization of Helium with Synchrotron X-Rays, Argonne, IL, October, 1993 (invited paper).

200. "Photoionization Plus Excitation in the Ground State of Atomic Mg," Division of Atomic, Molecular and Optical Physics, American Physical Society, Washington, DC, April, 1994.

201. "Photoionization/Photodetachment of the 1s2s2p ^4P State of Li and He^-," Division of Atomic, Molecular and Optical Physics, American Physical Society, Washington, DC, April, 1994.

202. "Theoretical Aspects of Target and Projectile Ionization," Symposium on Two-Center Effects in Ion-Atom Collisions, Lincoln, NE, May, 1994 (invited Paper).

203. "Ratio of Double to Single Ionization of He by Photon and Charged Particle Impact," International Conference on the Application of Accelerators in Research and Industry, Denton, TX, Nov., 1994 (invited paper).

204. "Simultaneous Ionization and/or Excitation in Few-Body Collisions: Electron-Electron Interactions," Fourth US-Mexico Symposium on Atomic and Molecular Physics, Mexico City, Dec., 1994 (invited paper).

205. "Resonances and Cooper Minima in the Photodetachment of the 1s2s2p ^4P State of He^-," Division of Atomic, Molecular and Optical Physics, American Physical Society, Toronto, Canada, May, 1995.

206. "Eigenchannel R-matrix Calculation for the Photodetachment of He^- (^4P)," Division of Atomic, Molecular and Optical Physics, American Physical Society, Toronto, Canada, May, 1995.

207. "Photoionization of Atomic Scandium in the 3p 6 3d Resonance Region," Division of Atomic, Molecular and Optical Physics, American Physical Society, Toronto, Canada, May, 1995.

208. "Photodetachment Studies of He^-," Electron Impact Symposium, Reno, NV, July, 1995 (invited paper).

209. "Photoionization of the $6s7p\ ^1P$ Excited State of Atomic Barium: A Combined Theoretical and Experimental Study," XIX International Conference on the Physics of Electronic and Atomic Collisions, Whistler, Canada, July, 1995.

210. "Photodetachment of the $1s2s2p\ ^4P$ State of He^-: Theoretical Studies of the $1s2p^2$ and $2s2p^2$ Resonances," XIX International Conference on the Physics of Electronic and Atomic Collisions, Whistler, Canada, July, 1995.

211. "Photoionization of Ground State Atomic Scandium: Many-Body-Perturbation Theory Calculation from Threshold to 70 eV," XIX International Conference on the Physics of Electronic and Atomic Collisions, Whistler, Canada, July, 1995.

212. "Coincidence Studies of Target and Projectile Ionization in Fast Dressed Particle Collisions," XIX International Conference on the Physics of Electronic and Atomic Collisions, Whistler, Canada, July, 1995.

213. "Double Ionization of Helium By Photons and Charged Particles at High Energy," Workshop on Two-Electron Processes in Photon-Helium Interaction, Boulder, CO, Jan., 1996 (invited paper).

214. "Double Ionization Close to Threshold as Seen By the Recoiling Ion," Workshop on Two-Electron Processes in Photon-Helium Interaction, Boulder, CO, Jan., 1996 (invited paper).

215. "The Calculation and Phenomenology of Photoionization," Indo-US Workshop on Radiation Physics, Siliguri, India, March, 1996 (invited paper).

216. "Photoabsorption of Inner Shells in the X-Ray Range: Recent Results," Indo-US Workshop on Radiation Physics, Darjeeling, India, March, 1996 (invited paper).

217. "Photoionization of the Ground $3s^23p^63d\ ^2D$ State of Sc^{++}: Many-Body-Perturbation Theory (MBPT) Calculations," Division of Atomic, Molecular and Optical Physics, American Physical Society, Ann Arbor, MI, May, 1996.

218. "Relativistic MQDT Analysis of the $2p \rightarrow ns,nd$ Autoionizing Resonances in the Mg Isoelectronic Sequence," Division of Atomic, Molecular and Optical Physics, American Physical Society, Ann Arbor, MI, May, 1996.

219. "Recoil Momentum Spectroscopy of Double and Single Ionization of he by 80-400 eV Photons," Division of Atomic, Molecular and Optical Physics, American Physical Society, Ann Arbor, MI, May, 1996.

220. "Cross sections for Photoionization of the 6s7p $^1P_1$ Excited State of Barium," Division of Atomic, Molecular and Optical Physics, American Physical Society, Ann Arbor, MI, May, 1996.

221. "Photoionization of Laser Excited Atoms," XV International Conference on Atomic Physics, Amsterdam, Aug., 1996.

222. "Modern Studies of Photoabsorption by Atoms and Ions," XVIII Symposium on the Physics of Ionized Gases, Kotor, Yugoslavia, Sept., 1996 (invited paper).

223. "Inner Shell Photoionization of Sc^{++}," XIV International Conference on X-ray and Inner Shell Processes, Hamburg, Germany, Sept., 1996.

224. "Ratio of Double to Single Ionization by 85-400 eV Photons," XIV International Conference on X-ray and Inner Shell Processes, Hamburg, Germany, Sept., 1996.

225. "Electron-Electron Interactions in Neutral Collisions," International Conference on the Application of Accelerators in Research and Industry, Denton, TX, Nov., 1996 (invited paper).

226. "Photoabsorption of Atoms and Ions in the Light of INDUS," XI National Conference on Atomic and Molecular Physics, Madras, India, Dec., 1996 (invited paper).

227. "Character Analysis of the 2p→ns,nd Autoionization Resonances in the Ne Isoelectronic Sequence," XI National Conference on Atomic and Molecular Physics, Madras, India, Dec., 1996.

228. "RMQDT Analysis of the Autoionization Resonances in Be," XI National Conference on Atomic and Molecular Physics, Madras, India, Dec., 1996.

229. "Breakdown of the Independent Particle Approximation in High-Energy Photoionization," Division of Atomic, Molecular and Optical Physics, American Physical Society, Washington, D.C., April, 1997.

230. "Photoelectron Angular Distribution of the 2p Subshell of the 1s2s2p ^4P State of He^-, Li and Be^+," Division of Atomic, Molecular and Optical Physics, American Physical Society, Washington, D.C., April, 1997.

231. "Calculation of Photoionization with Excitation of Ground State Neon," Division of Atomic, Molecular and Optical Physics, American Physical Society, Washington, D.C., April, 1997.

232. "Interchannel Coupling in High-Energy Photoionization," International Workshop on Photoionization, Chester, England, July, 1997.

233. "Anomalous Behavior of the Threshold Photoionization Cross Section in the Neon Isoelectronic Sequence, International Workshop on Photoionization, Chester, England, July, 1997.

234. "Extensive Study of the $2p_{1/2} \rightarrow ns,nd$ Autoionizing Resonances in the Neon Isoelectronic Sequence," XX International Conference on the Physics of Electronic and Atomic Collisions, Vienna, Austria, July, 1997.

235. "Valence $p_{1/2} \rightarrow ns,nd$ Autoionizing Resonances in the Xenon Isonuclear Sequence: A Study of Eigenchannel Character," XX International Conference on the Physics of Electronic and Atomic Collisions, Vienna, Austria, July, 1997.

236. "Low Energy Valence Photoionization in the Neon Isoelectronic Sequence: Some Important Effects Due to Z Variation," XX International Conference on the Physics of Electronic and Atomic Collisions, Vienna, Austria, July, 1997.

237. "Valence Shell Photoionization in Beryllium," XX International Conference on the Physics of Electronic and Atomic Collisions, Vienna, Austria, July, 1997.

238. "Relativistic Multichannel Quantum-Defect Theory Study of $5p_{1/2}6ns,nd$ Autoionizing Resonances in the Xenon Isoelectronic Sequence," XX International Conference on the Physics of Electronic and Atomic Collisions, Vienna, Austria, July, 1997.

239. "R-Matrix Calculation of Photoionization with Excitation of Ground State Neon," XX International Conference on the Physics of Electronic and Atomic Collisions, Vienna, Austria, July, 1997.

240. "R-Matrix Calculation of $^1P^o$ Double-Excitation States in Helium," XX International Conference on the Physics of Electronic and Atomic Collisions, Vienna, Austria, July, 1997.

241. "Photoelectron Angular Distributions from Inner and Outer Subshells of Positive Ions of Low-Z Atoms: Systematic Properties," XX International Conference on the Physics of Electronic and Atomic Collisions, Vienna, Austria, July, 1997.

242. "Interchannel Coupling and the Breakdown of the Independent Particle Approximation in Photoionization Far Above Threshold," XX International Conference on the Physics of Electronic and Atomic Collisions, Vienna, Austria, July, 1997.

243. "Elastic Scattering of Electrons From Positive Ions of Low-Z Atoms: Low Energy to 100 eV," XX International Conference on the Physics of Electronic and Atomic Collisions, Vienna, Austria, July, 1997.

244. "The Binary Peak and Elastic Scattering of Electrons From Positive Ions," XV International Seminar on Ion-Atom Collisions, Budapest, Hungary, August, 1997.

245. "Photoionization of Sc and Sc^{++} in the 3p63d Resonance Region," International Symposium on Lasers, Atomic and Molecular Physics, Istanbul, Turkey, Sept., 1997 (invited paper).

246. "Modern Studies of Photoionization of Atoms and Ions," International Symposium on Lasers, Atomic and Molecular Physics, Istanbul, Turkey, Sept., 1997 (invited paper).

247. "Differential Electron-Ion Elastic Scattering Cross Sections," International Conference on Atomic and Molecular Data and Their Applications, Gaithersburg, MD, Oct., 1997.

248. "Photoelectron Angular Distributions for Positive Ions," International Conference on Atomic and Molecular Data and Their Applications, Gaithersburg, MD, Oct., 1997.

249. "Photoionization of Atomic Ions and Related Electron Scattering Processes," Topical Conference on Atomic Processes in Plasmas, Auburn, AL, March, 1998 (invited paper).

250. "Photoionization Cross Sections of Atoms and Ions Related to Astrophysical Problems," Laboratory Space Science Workshop, Boston, MA, April, 1998.

251. "Elastic Scattering of Electrons By Positive Ions," Laboratory Space Science Workshop, Boston, MA, April, 1998.

252. "Photoionization Cross Sections for Excited Laser-Cooled Cesium Atoms," Division of Atomic, Molecular and Optical Physics, American Physical Society, Santa Fe, NM, May, 1998.

253. "Backscattering in Electron-Ion Elastic Collisions," Division of Atomic, Molecular and Optical Physics, American Physical Society, Santa Fe, NM, May, 1998.

254. "Photoionization of the Excited 3d State of K," Division of Atomic, Molecular and Optical Physics, American Physical Society, Santa Fe, NM, May, 1998.

255. "Comparison Study of Positive Ions of Iron Using Relativistic Random Phase Approximation and the R-Matrix Method," Division of Atomic, Molecular and Optical Physics, American Physical Society, Santa Fe, NM, May, 1998.

256. "Photoionization of Ba 6p ^{1}P and 7p ^{1}P in the Vicinity of the $5d_{5/2}$ Limit," Division of Atomic, Molecular and Optical Physics, American Physical Society, Santa Fe, NM, May, 1998.

257. "Correlation Effects in Xe^+ Photoionization," Division of Atomic, Molecular and Optical Physics, American Physical Society, Santa Fe, NM, May, 1998.

258. "Photoionization of the 1s2s2p ^{4}P Lithium Metastable State," Division of Atomic, Molecular and Optical Physics, American Physical Society, Santa Fe, NM, May, 1998.

259. "Inner-Shell Photoionization of Excited Lithium: One- and Two-Electron Processes," Division of Atomic, Molecular and Optical Physics, American Physical Society, Santa Fe, NM, May, 1998.

260. “Valence Photoionization of Argon,” Gordon Conference on Electron Spectroscopy, Hennicker, NH, July, 1998.

261. "Photoionization Cross Section and Resonance Structure of 3d Excited Potassium," XII International Conference on Vacuum Ultraviolet Radiation Physics, San Francisco, CA, August, 1998.

262. "Photoionization of Atomic I and Its Ions: Dramatic Discrepancies between Theory and Experiment," XII International Conference on Vacuum Ultraviolet Radiation Physics, San Francisco, CA, August, 1998.

263. "High-Energy Valence Photoionization of Argon: Effect of Interaction with 3s Photoionization Channels," XII International Conference on Vacuum Ultraviolet Radiation Physics, San Francisco, CA, August, 1998.

264. "'Complete' Experiments with Fewer Measurements of a Two-Channel Photoionization Process," XII International Conference on Vacuum Ultraviolet Radiation Physics, San Francisco, CA, August, 1998 (invited paper).

265. “Photoionization Cross Sections for Excited Laser-Cooled Cesium Atoms,” XVI Conference on Atomic Physics, Windsor, Canada, August, 1998.

266. "Inner-Shell Photoionization of Excited Lithium," XII International Conference on Vacuum Ultraviolet Radiation Physics, San Francisco, CA, August, 1998.

267. "Problems in Atomic Collision Physics: Can Wavelets Help?" Workshop on Wavelets and Applications in Physics and Astrophysics, Cambridge, MA, October, 1998 (invited paper).

268. "Photoionization of Ions: Positive and Negative," International Conference on the Application of Accelerators in Research and Industry, Denton, TX, Nov., 1998 (invited paper).

269. “Validity of the Independent-Particle Approximation in X-Ray Photoemission: The Exception, Not the Rule," Cross Country Symposium on Novel Interactions of X-Rays and Matter, Tokyo, Japan, Jan., 1999 (invited paper).

270. “Inner Shell Photoionization of Atoms and Ions in the X-Ray Range,” Cross Country Symposium on Novel Interactions of X-Rays and Matter, Osaka, Japan, Jan., 1999 (invited paper).

271. “High-Energy Valence Photoionization of Argon: Effect of Interaction with 3s Photoionization Channels,” Centennial Meeting, American Physical Society, Atlanta, GA, March, 1999.

272. “Analysis of 2l2l’n’’l’’ Resonances in the Photoionization of $1s^2$ 2p Excited Lithium,” Centennial Meeting, American Physical Society, Atlanta, GA, March, 1999.

273. “RPA Studies of Nondipolar Angular-Distribution Asymmetry Parameters in the n=2 Shell of Neon,” Centennial Meeting, American Physical Society, Atlanta, GA, March, 1999.

274. “Relativistic Effects in the Photoionization of Ne-like Iron,” Centennial Meeting, American Physical Society, Atlanta, GA, March, 1999.

275. “Enhanced Non-Dipole Effects in Low Energy Photoionization,” Centennial Meeting, American Physical Society, Atlanta, GA, March, 1999.

276. “Relativistic Effects in Atomic and Ionic Photoionization: 'Anomalous' Behavior at the Low End of Isoelectronic Sequences," XXI International Conference on the Physics of Electronic and Atomic Collisions, Sendai, Japan, July, 1999.

277. “Photoabsorption Threshold Anomaly in the Argon Isoelectronic Sequence,” XXI International Conference on the Physics of Electronic and Atomic Collisions, Sendai, Japan, July, 1999.

278. “Photoionization of Neon-like Ions: Effect of Interchannel Coupling at Higher Energies,” XXI International Conference on the Physics of Electronic and Atomic Collisions, Sendai, Japan, July, 1999.

279. “Augmented Many-Body Perturbation Theory Calculations of Inner-Shell Photoionization of Sc and Sc^{++}: A Comparison,” XXI International Conference on the Physics of Electronic and Atomic Collisions, Sendai, Japan, July, 1999.

280. “R-Matrix Calculation of the Photodetachment of $He^-1s2s2p\ ^4P$ in the region of the 1s Threshold,” XXI International Conference on the Physics of Electronic and Atomic Collisions, Sendai, Japan, July, 1999.

281. “Photoionization of the $1s^22s2p\ ^{1,\ 3}P$ States of Atomic Be,” XXI International Conference on the Physics of Electronic and Atomic Collisions, Sendai, Japan, July, 1999.

282. “New Theoretical and Experimental Results for Autoionization of the Lowest Doubly Hollow Lithium State into Several Continua of the Doubly-Excited Li^+ Ion,” XXI International Conference on the Physics of Electronic and Atomic Collisions, Sendai, Japan, July, 1999.

283. “Photoionization of Ions,” International Seminar on Ion-Atom Collisions, Kyoto, Japan, July, 1999 (invited paper).

284. “On the Asymptotic Behavior of the Photoionization Cross Section,” XVIII International Conference on X-Ray and Inner-Shell Processes, Chicago, IL, Aug. 1999.

285. “High Energy Behavior of the Subshell Photoionization Cross Sections of Pd 4d, 4p and 4s,” XVIII International Conference on X-Ray and Inner-Shell Processes, Chicago, IL, Aug. 1999.

286. “Compression of Atomic Orbitals by a Hollow Attractive Shell,” XVIII International Conference on X-Ray and Inner-Shell Processes, Chicago, IL, Aug. 1999.

287. “Atomic Data For Astrophysics: Photoionization of the Ne Isoelectronic Sequence Including Relativistic Effects,” Atomic Processes in Plasmas, Reno, NV, March, 2000.

288. “An Introduction to Modern Studies of Photoionization,” Pan-American Advanced Study Institute, Angra de Reis, Brazil, April, 2000 (invited paper).

289. “Photoionization of Ions, Positive and Negative,” Pan-American Advanced Study Institute, Angra de Reis, Brazil, April, 2000 (invited paper).

290. “Photoionization of Ions,” Workshop on Many-Particle Dynamics in Coulomb Systems, Bad Honnef, Germany, May, 2000 (invited paper).

291. "Photoelectron Angular Distributions in the Photoionization of Atomic Sc," Division of Atomic, Molecular and Optical Physics, American Physical Society, Storrs, CN, June, 2000.

292. "Controlled Non-Dipole effects in Photoionization of Atoms," Division of Atomic, Molecular and Optical Physics, American Physical Society, Storrs, CN, June, 2000.

293. "Photodetachment of Ca^-," Division of Atomic, Molecular and Optical Physics, American Physical Society, Storrs, CN, June, 2000.

294. "Photodetachment of He- in the Region of 1s Threshold: β Parameters," Division of Atomic, Molecular and Optical Physics, American Physical Society, Storrs, CN, June, 2000.

295. "Anomaly in Atomic *nl* Photoionization with Intermediate *l*," XX Symposium on the Physics of Ionized Gases, Zlatibor, Yugoslavia, Sept., 2000.

296. "First Prediction of Many-Body effects in Photoelectron Non-Dipole Angular Distribution Spectra at keV Photon Energies," International Workshop on Photoionization, Carre-le-Rouet, France, Oct., 2000.

297. "Photoionization of Atomic Titanium Including the $3p^6 3d$ Resonances," International Workshop on Photoionization, Carre-le-Rouet, France, Oct., 2000.

298. "Systematics of Electron Ejection in Fast Neutral-Neutral Collisions," International Conference on the Application of Accelerators in Research and Industry, Denton, TX, Nov., 2000 (invited paper).

299. "Determination of Relative and Absolute Photoionization Cross-Sections in Multiply-Charged Ba^{n+} Ions," Division of Atomic, Molecular and Optical Physics, American Physical Society, London, Ontario, May, 2001.

300. "Inner-Shell Photodetachment of Li^-," Division of Atomic, Molecular and Optical Physics, American Physical Society, London, Ontario, May, 2001.

301. "Enhanced Electron Correlation in Hollow Atoms," Division of Atomic, Molecular and Optical Physics, American Physical Society, London, Ontario, May, 2001.

302. "Photoionization of Atoms at high Energy," Division of Atomic, Molecular and Optical Physics, American Physical Society, London, Ontario, May, 2001.

303. "Relativistic Effects on Interchannel Coupling in Atomic Photoionization: The Photoelectron Angular Distribution of Xe 5s," Division of Atomic, Molecular and Optical Physics, American Physical Society, London, Ontario, May, 2001.

304. "Trends in Nondipole Photoelectron Angular Distributions from Free and Confined Atoms," XXII International Conference on Photonic, Electronic and Atomic Collisions, Santa Fe, NM, July, 2001.

305. "Photodetachment of $Li^- 1s^2 2s^2\ ^1S$ in the Region of the 1s Threshold: Cross Section Parameters," XXII International Conference on Photonic, Electronic and Atomic Collisions, Santa Fe, NM, July, 2001.

306. "Photoionization of Multiply-charged Ions along the Ba Isonuclear Sequence up to Ba6+," XXII International Conference on Photonic, Electronic and Atomic Collisions, Santa Fe, NM, July, 2001.

307. "High-resolution Experimental Studies and Theoretical Calculations of Spin-orbit- And Total Angular Momentum-resolved Photoionization of Sodium," XXII International Conference on Photonic, Electronic and Atomic Collisions, Santa Fe, NM, July, 2001.

308. "K-Shell Double Photodetachment of Li^-: Experiment and Theory," XXII International Conference on Photonic, Electronic and Atomic Collisions, Santa Fe, NM, July, 2001.

309. "Photoionization of Atomic Scandium," XII International Conference on Vacuum Ultraviolet Radiation Physics, Trieste, Italy, July, 2001.

310. “Multi-Centered Theory of Molecular Photoionization,” XII International Conference on Vacuum Ultraviolet Radiation Physics, Trieste, Italy, July, 2001.

311. “Spectral Properties of Confined Atoms,” XII International Conference on Vacuum Ultraviolet Radiation Physics, Trieste, Italy, July, 2001.

312. “New Perspectives in Photoionization of Atoms and Ions in Unusual Situations,” Workshop on X-Ray Photoionization, Las Vegas, NV, Dec., 2001 (invited paper).

313. “Interchannel Coupling in the Photoionization of Ions,” Laboratory Astrophysics Workshop 2002, Moffett Field, CA, May, 2002.

314. “Strong Electron Correlation in Photoionization of Spin-Orbit Doublets,” Division of Atomic, Molecular and Optical Physics, American Physical Society, Williamsburg, VA, May, 2002.

315. “Photoionization Studies Of Doubly Ionized Silicon: Comparison of Theoretical and Experimental Investigation,” Division of Atomic, Molecular and Optical Physics, American Physical Society, Williamsburg, VA, May, 2002.

316. “Relativistic Effects on Dipole and Nondipole Interchannel Coupling in Atomic Photoionization: The Photoelectron Angular Distributions of Xe 5s and 5p,” Division of Atomic, Molecular and Optical Physics, American Physical Society, Williamsburg, VA, May, 2002.

317. “Strong Electron Correlation in Photoionization of Spin-Orbit Doublets,” Division of Atomic, Molecular and Optical Physics, American Physical Society, Williamsburg, VA, May, 2002.

318. “Photoionization of the $Li@C_{60}$ Endohedral Atom,” International Conference on X-Ray and Inner-Shell Processes, Rome, Italy, June, 2002.

319. “Interchannel Coupling Effects in Spin Polarization in X-Ray Photoionization,” International Conference on X-Ray and Inner-Shell Processes, Rome, Italy, June, 2002.

320. “Theoretical Study of the Photoionization of Atomic Titanium,” International Conference on X-Ray and Inner-Shell Processes, Rome, Italy, June, 2002.

321. “Strong Electron Correlation in Photoionization of Spin-Orbit Doublets,” Fano Memorial Symposium, Cambridge, MA, July, 2002.

322. “Photoabsorption by Atoms and Ions: Recent Results and New Physics,” Southeastern Section of the American Physical Society, Auburn, AL, Nov., 2002 (invited paper).

323. “Large Nondipole Parameters near Giant Dipole Resonances,” Southeastern Section of the American Physical Society, Auburn, AL, Nov., 2002.

324. “Dramatic Structure in K-Shell Photodetachment of Negative ions,” XVII International Conference on the Application of Accelerators in Research and Industry, Denton, TX, Nov., 2002 (invited paper).

325. “On the Effect of Intra-doublet Correlations upon the Nondipole Parameters in Xe, Cs and Ba,” Annual Meeting of the Israeli Physical Society, Rohovoth, Israel, Dec., 2002.

326. “Many-Body Effects and New Phenomena in Atomic and Molecular Photoionization,” Indo-US Workshop on Radiation Physics, Argonne, IL, May, 2003 (invited paper).

327. “Strong Inter-channel Effects in Dipole Photoionization of d-Subshells of Xe, Cs, and Ba Atoms,” Division of Atomic, Molecular and Optical Physics, American Physical Society, Boulder, CO, May, 2003.

328. “Spin-Orbit Induced Interchannel Coupling in Atomic Photoionization,” Division of Atomic, Molecular and Optical Physics, American Physical Society, Boulder, CO, May, 2003.

329. “Dramatic Nondipole Effects in Low-Energy Photoionization: Experimental and Theoretical Study of Xe 5s,” Division of Atomic, Molecular and Optical Physics, American Physical Society, Boulder, CO, May, 2003.

330. “Photodetachment of C^-,” Division of Atomic, Molecular and Optical Physics, American Physical Society, Boulder, CO, May, 2003.

331. “Inner-Shell Photodetachment of Li^-: Photoelectron Recapture,” Division of Atomic, Molecular and Optical Physics, American Physical Society, Boulder, CO, May, 2003.

332. “Diffraction of Slow Electrons by C_{60} Fullerene Cage,” Division of Atomic, Molecular and Optical Physics, American Physical Society, Boulder, CO, May, 2003.

333. “Angle-Resolved Photoionization Cross Sections of Li and Ar Endohedral Atoms,” Division of Atomic, Molecular and Optical Physics, American Physical Society, Boulder, CO, May, 2003.

334. “Confinement Resonances in Photoelectron Angular Distributions from Endohedral Atoms,” Division of Atomic, Molecular and Optical Physics, American Physical Society, Boulder, CO, May, 2003.

335. “Dipole Autoionizing Resonances in Dipole-Quadrupole Photoionization Interferences,” Division of Atomic, Molecular and Optical Physics, American Physical Society, Boulder, CO, May, 2003.

336. “Photoionization of Confined Atoms,” International Symposium on Atomic Cluster Collisions, St. Petersburg, Russia, July, 2003 (invited paper).

337. "Diffraction of Slow Electrons by C_{60} Cage," International Symposium on Atomic Cluster Collisions, St. Petersburg, Russia, July, 2003.

338. "Confinement Resonance in Photoelectron Angular Distributions from Endohedral Atoms," International Symposium on Atomic Cluster Collisions, St. Petersburg, Russia, July, 2003.

339. "Dipole Photoelectron Angular Distribution Parameters for Xe, Cs and Ba 3s," XXIII International Conference on Photonic, Electronic and Atomic Collisions, Stockholm, Sweden, July, 2003.

340. "Dramatic Nondipole effects in Low-Energy Photoionization: Experimental and Theoretical Study of Xe 5s," XXIII International Conference on Photonic, Electronic and Atomic Collisions, Stockholm, Sweden, July, 2003.

341. "Inter-Doublet Correlation Effects on the Nondipole Parameters, "XXIII International Conference on Photonic, Electronic and Atomic Collisions, Stockholm, Sweden, July, 2003.

342. "New Collective Effects in Atomic Photoionization," XXIII International Conference on Photonic, Electronic and Atomic Collisions, Stockholm, Sweden, July, 2003.

343. "Inner Shell Photodetachment of Li-: Photoelectron Recapture," XXIII International Conference on Photonic, Electronic and Atomic Collisions, Stockholm, Sweden, July, 2003.

344. "R-Matrix Calculations of the Photodetachment of $C^- 1s^2 2s^2 2p^3$ ($^4P^o$) in the Region of the 1s Threshold," XXIII International Conference on Photonic, Electronic and Atomic Collisions, Stockholm, Sweden, July, 2003.

345. "Small Interactions with large Effects on Photoabsorption: Nondipole, Spin-Orbit and Others," Gordon Conference on Photoions, Photoionization and Photodetachment, Oxford, England, Sept., 2003 (invited paper).

346. "The Essential Physics of the Interaction of Photons and Atoms at Low Energy," Indo-US Workshop in Radiation Physics, Siliguri, India, March, 2004 (invited paper).

347. "New Correlation Effects in the Photoionization of Atoms and Ions," Indo-US Workshop in Radiation Physics, Darjeeling, India, March, 2004 (invited paper).

348. "Nondipole Effects in Soft X-ray Photoemission from Atoms and Molecules," Indo-US Workshop in Radiation Physics, Darjeeling, India, March, 2004 (invited paper).

349. "Photoabsorption by the Be Isoelectronic Sequence," Topical Conference on Atomic Processes in Plasmas, Santa Fe, NM, April, 2004.

350. "Photodetachment of the Excited $1s^2 2s^2 2p^3\ ^2D^0$ State of C^-," Division of Atomic, Molecular and Optical Physics, American Physical Society, Tucson, AZ, May, 2004.

351. "Nondipole Effects in the Photoionization of Xe 4d: Evidence for Quadrupole Satellites," Division of Atomic, Molecular and Optical Physics, American Physical Society, Tucson, AZ, May, 2004.

352. "Retardation Effects in Molecular Photodetachment," Division of Atomic, Molecular and Optical Physics, American Physical Society, Tucson, AZ, May, 2004.

353. "R-Matrix Calculation of the Outer-Shell Photoionization of Ni^{15+}," Division of Atomic, Molecular and Optical Physics, American Physical Society, Tucson, AZ, May, 2004.

354. "Photoabsorption by Atoms and Ions," Symposium on the Physics of Ionized Gases, Tara, Serbia and Montenegro, Sept., 2004 (invited paper).

355. "Photoabsorption by Atoms and Ions," 2004 Atomic, Molecular and Optical Sciences Research Meeting, Airlie, VA, Sept., 2004 (invited paper).

356. "Doing Physics with Third World Collaborators," American Physical Society, Los Angeles, CA, March, 2005 (invited paper).

357. "Correlation Effects in the Photoionization of Confined Calcium and Zinc," Division of Atomic, Molecular and Optical Physics, American Physical Society, Lincoln, NE, May, 2005.

358. "Satellite Lines in High-Energy Atomic Photoionization," Division of Atomic, Molecular and Optical Physics, American Physical Society, Lincoln, NE, May, 2005.

359. "Photoionization of Atoms and Ions confined by Negatively-Charged C_{60}," Division of Atomic, Molecular and Optical Physics, American Physical Society, Lincoln, NE, May, 2005.

360. "Nondipole Photoionization parameters of Atomic Mercury," Division of Atomic, Molecular and Optical Physics, American Physical Society, Lincoln, NE, May, 2005.

361. " Electron-Electron and Electron-Nuclear Interactions in Ionizing Atom-Atom Collisions, Division of Atomic, Molecular and Optical Physics, American Physical Society, Lincoln, NE, May, 2005.

362. "K-Shell Photodetachment of Excited C^-," Division of Atomic, Molecular and Optical Physics, American Physical Society, Lincoln, NE, May, 2005.

363. "Photodetachment of Excited C^-: Angular Distributions," Division of Atomic, Molecular and Optical Physics, American Physical Society, Lincoln, NE, May, 2005.

364. "R-matrix with Intermediate Coupling Frame Transformation Calculation of the Spin-Orbit Interactions in Ar Photoionization, Division of Atomic, Molecular and Optical Physics, American Physical Society, Lincoln, NE, May, 2005.

365. "Study of Spin-Orbit Resolved Angular Distribution Components of Xe 5p," Division of Atomic, Molecular and Optical Physics, American Physical Society, Lincoln, NE, May, 2005.

366. "*n*f Subshell Photoionization Near-Threshold," XXIV International Conference on the Physics of Electronic, Atomic and Photonic Collisions, Rosario, Argentina, July, 2005.

367. "New Correlation Effects in Nonrelativistic Atomic Dipole Photoionization in the High-Energy Limit," XXIV International Conference on the Physics of Electronic, Atomic and Photonic Collisions, Rosario, Argentina, July, 2005.

368. "Correlation Effects on Cooper Minima in the Photoionization of *n*s Subshells of Free and Confined Atoms," International Workshop on Photoionization, Campinas, Brazil, July, 2005.

369. "Study of Spin-Orbit Resolved Angular Distribution Components of Xe 5p," International Workshop on Photoionization, Campinas, Brazil, July, 2005.

370. "Photoionization of Atoms Confined Inside a $C_{60}^{\pm q}$ Shell," International Workshop on Photoionization, Campinas, Brazil, July, 2005.

371. "Multiple Minima in Dipole Transitions from the 6s Subshell of Atomic Mercury," International Workshop on Photoionization, Campinas, Brazil, July, 2005.

372. "Photoionization of Free and Confined Atoms," Synchrotron Research Center-38th User's Meeting, Stoughton, WI, Oct., 2005 (invited paper).

373. "New Phenomenology in Photoabsorption Studies of Free and Confined Atoms and Ions," US-Africa Advanced Studies Institute: Photon Interactions with Atoms and Molecules, Durban, South Africa, Nov., 2005 (invited paper).

374. "Recent Findings in the Physics of Free/Confined Atoms/Ions," Symposium on Atomic & Molecular Physics, Chennai, India, Jan., 2006 (invited paper).

375. "Calculation of Atomic Data for NASA Missions," NASA Laboratory Astrophysics Workshop, Las Vegas, NV, Feb., 2006.

376. "The Atomic and Ionic Data for Astrophysics (AIDA) Project at Georgia State University," NASA Laboratory Astrophysics Workshop, Las Vegas, NV, Feb., 2006.

377. "Inner-shell Photodetachment of Na-," Division of Atomic, Molecular and Optical Physics, American Physical Society, Knoxville, TN, May, 2006.

378. "Importance of Configuration Interaction from accurate Atomic data: Fluorescence Yields of K-Shell Vacancy Lithium-Like Ions," Division of Atomic, Molecular and

Optical Physics, American Physical Society, Knoxville, TN, May, 2006.

379. "First Observation of a Quadrupole Cooper Minimum in the Photoionization of Xe 5*p*," Division of Atomic, Molecular and Optical Physics, American Physical Society, Knoxville, TN, May, 2006.

380. "Deviation of β from 2.0 for the for the Kr and Xe 4s and 5s Photoelectrons at the nd6mp (n=4 for Kr, n=5 for Xe) Excitations," Division of Atomic, Molecular and Optical Physics, American Physical Society, Knoxville, TN, May, 2006.

381. "Term Dependence of Nondipole Valence s-photoelectron Angular Distributions from Half-filled Shell Atoms," Division of Atomic, Molecular and Optical Physics, American Physical Society, Knoxville, TN, May, 2006.

382. "X-Ray and Inner-Shell Physics in a New (and Brighter) Light," Workshop on X-ray Free-Electron Lasers: Challenges for Theory, Cambridge, MA, June, 2006 (invited paper).

383. "Photoabsorption by Atomic Systems: Computational Successes, Problems and Prospects," Computations in Quantum Many-Body Physics, Santa Fe, NM, June, 2006 (invited paper).

384. "Recent Progress in the Photoionization of Atomic Systems," XIX International Conference on the Application of Accelerators in Research and Industry, Fort Worth, TX, Aug., 2006 (invited paper).

385. "Fluorescence Yields for Highly-Charged Ions: State Dependence," International Conference on Highly-Charged Ions, Belfast, Northern Ireland, August, 2006.

386. "Deviation of β for the Kr and Xe 4s and 5s Photoelectrons at the nd → mp (n=3 for Kr, n=4 for Xe) Excitations," International Conference on Electronic Spectroscopy and Structure, Foz do Iguaçu, Brazil, Aug., 2006.

387. "Theoretical Studies of Photoabsorption by Atomic Systems – Neutral Atoms, Positive and Negative Ions," XVI National Conference on Atomic and Molecular Physics, Mumbai, India, Jan., 2007 (invited paper).

388. "New and Improved Atomic Data for Accurate Plasma Modeling," 15th International Conference on Atomic Processes in Plasmas, Gaithersburg, MD, March, 2007.

389. "Electron-correlation induced blue-shift of oscillator strength in photoabsorption by clusters," 38th Annual Meeting of the Division of Atomic, Molecular and Optical Physics of the American Physical Society, Calgary, Alberta, Canada, June, 2007.

390. "Calculation of inner-shell photoionization of ground state Na: relativistic vs. nonrelativistic calculation," 38th Annual Meeting of the Division of Atomic, Molecular and Optical Physics of the American Physical Society, Calgary, Alberta, Canada, June, 2007.

391. “Dynamical and relativistic effects in experimental and theoretical studies for inner-shell photoionization of sodium,” 38th Annual Meeting of the Division of Atomic, Molecular and Optical Physics of the American Physical Society, Calgary, Alberta, Canada, June, 2007.

392. “Enhancement in low energy valence photoionization of Ar confined in C_{60},” 38th Annual Meeting of the Division of Atomic, Molecular and Optical Physics of the American Physical Society, Calgary, Alberta, Canada, June, 2007.

393. “Half-filled shell atoms as intense sources of spin-polarized photoelectrons,” 38th Annual Meeting of the Division of Atomic, Molecular and Optical Physics of the American Physical Society, Calgary, Alberta, Canada, June, 2007.

394. “K-shell Fluorescence Yields of Li- to F-like Ions,” 38th Annual Meeting of the Division of Atomic, Molecular and Optical Physics of the American Physical Society, Calgary, Alberta, Canada, June, 2007.

395. “Systematic study of zeros in bound-free matrix elements,” 38th Annual Meeting of the Division of Atomic, Molecular and Optical Physics of the American Physical Society, Calgary, Alberta, Canada, June, 2007.

396. “Extensive computation of allowed and forbidden transition probabilities in the potassium isoelectronic sequence,” 38th Annual Meeting of the Division of Atomic, Molecular and Optical Physics of the American Physical Society, Calgary, Alberta, Canada, June, 2007.

397. “On autoionizing variations in the photoelectron β-parameter spectrum,” XXV International Conference on Photonic, Electronic and Atomic Collisions, Freiburg, Germany, July, 2007.

398. “Inner-shell photoionization of sodium: a combined experimental and theoretical study,” XXV International Conference on Photonic, Electronic and Atomic Collisions, Freiburg, Germany, July, 2007.

399. “X-ray absorption in carbon ions near the K-edge,” XXV International Conference on Photonic, Electronic and Atomic Collisions, Freiburg, Germany, July, 2007.

400. “Valence photoionization of Mg caged in C_{60}: Effects of plasmon resonance and orbital hybridization,” XXV International Conference on Photonic, Electronic and Atomic Collisions, Freiburg, Germany, July, 2007.

401. “K-shell fluorescence yields of Li- to F-like ions,” XXV International Conference on Photonic, Electronic and Atomic Collisions, Freiburg, Germany, July, 2007.

402. “Electric quadrupole a magnetic dipole hyperfine constants for singly ionized cadmium,” XXV International Conference on Photonic, Electronic and Atomic Collisions, Freiburg, Germany, July, 2007.

403. "Photoabsorption by Free and Confined Atoms and Ions," 2007 Atomic, Molecular and Optical Sciences Research Meeting, Airlie, VA, Sept., 2007 (invited paper).

404. "Theoretical Studies of Photoabsorption by Confined Atoms," International Workshop on Atomic Physics, Dresden, Germany, Nov., 2007 (invited paper).

405. "Photoionization of Transition-Metal Ions," Workshop on Atomic Ion Stage Abundances in Astrophysical Plasmas, Auburn, AL, Feb., 2008.

406. "Photoionization of the Be Isoelectronic Sequence," Workshop on Atomic Ion Stage Abundances in Astrophysical Plasmas, Auburn, AL, Feb., 2008.

407. "Relativistic-Random-Phase Approximation Calculations of Atomic Photoionization: What We Have Learned," Symposium on Atomic Physics, South Bend, IN, April, 2008 (invited paper).

408. "Photoionization of Be-like Ions: R-matrix Calculations," 39th Annual Meeting of the Division of Atomic, Molecular and Optical Physics of the American Physical Society, State College, PA, May, 2008.

409. "Relativistic Effects in Inner-Shell Photoionization of Excited Sodium," 39th Annual Meeting of the Division of Atomic, Molecular and Optical Physics of the American Physical Society, State College, PA, May, 2008.

410. "Spin-Orbit Activated Interchannel Coupling Effect in Dipole and Quadrupole Photoionization," 39th Annual Meeting of the Division of Atomic, Molecular and Optical Physics of the American Physical Society, State College, PA, May, 2008.

411. "Quantum Young's Double-Slit-Type Interferences in Atomic Photoelectrons from Atom@C_{60} Molecules." 39th Annual Meeting of the Division of Atomic, Molecular and Optical Physics of the American Physical Society, State College, PA, May, 2008.

412. "Anomalous Behavior of Auger and Radiative Rates and Fluorescence Yields along the $1s2s^22p^3$ K-shell Isoelectronic Sequence," 39th Annual Meeting of the Division of Atomic, Molecular and Optical Physics of the American Physical Society, State College, PA, May, 2008.

413. "Photoionization of Sc^{+2}," 39th Annual Meeting of the Division of Atomic, Molecular and Optical Physics of the American Physical Society, State College, PA, May, 2008.

414. "Photoionization of Atoms Confined Inside Bucky-ball Onions," 39th Annual Meeting of the Division of Atomic, Molecular and Optical Physics of the American Physical Society, State College, PA, May, 2008.

415. "Near-ultraviolet Photoionization of Xe@C_{60}: Sizable Oscillator Strength Transfer From Shell to Atom," 39th Annual Meeting of the Division of Atomic, Molecular and Optical Physics of the American Physical Society, State College, PA, May, 2008.

416. “Theoretical studies of the photoionization of confined atoms,” International Workshop on Photoionization, Sätra Brunn, Sweden, June, 2008.

417. “Relativistic effects in inner-shell photoionization of excited sodium,” 21st International Conference on X-Ray and Inner-Shell Processes, Paris, France, June, 2008.

418. “Photoionization of Ions—Positive and Negative,” Workshop on Photon-Ion interaction Studies, Berkeley, CA, Oct., 2008 (invited paper).

419. “Photoionization of the Be isoelectronic Sequence,” 16th International Conference on Atomic processes in Plasmas, Monterey, CA, March, 2009.

420. “Theoretical Study of the Photoionization of Be-like Ions,” 40th Annual Meeting of the Division of Atomic, Molecular and Optical Physics of the American Physical Society, Charlottesville, VA, May, 2009.

421. “Xe@C_{60}: A ‘melting pot’ of multiple photo-effects,” 40th Annual Meeting of the Division of Atomic, Molecular and Optical Physics of the American Physical Society, Charlottesville, VA, May, 2009.

422. “Nondipole Effects in the Photodetachment of Cl^-,” 40th Annual Meeting of the Division of Atomic, Molecular and Optical Physics of the American Physical Society, Charlottesville, VA, May, 2009.

423. “Photoionization of Isonuclear Sequences,” 40th Annual Meeting of the Division of Atomic, Molecular and Optical Physics of the American Physical Society, Charlottesville, VA, May, 2009.

424. “Photoionization of Atomic Sc,” 40th Annual Meeting of the Division of Atomic, Molecular and Optical Physics of the American Physical Society, Charlottesville, VA, May, 2009.

425. “Inner-shell photoionization of atomic chlorine near the $2p^{-1}$ edge: a Breit-Pauli R-matrix calculation,” 40th Annual Meeting of the Division of Atomic, Molecular and Optical Physics of the American Physical Society, Charlottesville, VA, May, 2009.

426. “Theoretical Studies of the Ionization of Endohedral Atoms and Fullerenes,” International Conference on Atomic Cluster Collisions, Ann Arbor, MI, July, 2009 (invited paper).

427. “Giant spin-orbit interactions in Ar photoionization,” 26th International Conference on Photonic, Electronic and Atomic Collisions, Kalamazoo, MI, July, 2009.

428. “Fast electron impact ionization of endohedral atoms,” 26th International Conference on Photonic, Electronic and Atomic Collisions, Kalamazoo, MI, July, 2009.

429. “Ionization of C_{60} by fast bare-ion impact,” 26th International Conference on Photonic, Electronic and Atomic Collisions, Kalamazoo, MI, July, 2009.

430. “Theoretical Study of the Photoionization of Be-like Ions,” 26th International Conference on Photonic, Electronic and Atomic Collisions, Kalamazoo, MI, July, 2009.

431. “Photodetachment cross section of lithium negative ion,” 26th International Conference on Photonic, Electronic and Atomic Collisions, Kalamazoo, MI, July, 2009.

432. “Photoionization cross section of atomic cadmium using the Multi-Configuration Tamm-Dancoff Approximation,” 26th International Conference on Photonic, Electronic and Atomic Collisions, Kalamazoo, MI, July, 2009.

433. “Photoionization of Confined Atoms: Xe in a C_{60} Shell,” Gordon Research Conference on Photoions, Photoionization and Photodetachment, Galveston, TX, Feb., 2010.

434. “Atom-fullerene hybridization, giant enhancement and correlation confinement resonances in the photoionization of $Xe@C_{60}$,” M. McCune, H. Dale, H. Chakraborty, M. Madjet, J.-M. Rost, S. Manson, 41st Annual Meeting of the American Physical Society, Division of Atomic, Molecular and Optical Physics, Houston, TX, May, 2010.

435. “Overlapping Resonances in Atomic Ions,” W.-C. Chu, H.-L. Zhou, and S.T. Manson, 41st Annual Meeting of the American Physical Society, Division of Atomic, Molecular and Optical Physics, Houston, TX, May, 2010.

436. “Satellite lines in the photoionization of ions; The Be isoelectronic sequence,” W.-C. Chu, H.-L. Zhou, and S.T. Manson, 41st Annual Meeting of the American Physical Society, Division of Atomic, Molecular and Optical Physics, Houston, TX, May, 2010.

437. “Photoelectron angular distributions along Ar and Ca isonuclear sequences,” G. B. Pradhan, J. Jose, V. Radojević, P. C. Deshmukh, .and S. T. Manson, 41st Annual Meeting of the American Physical Society, Division of Atomic, Molecular and Optical Physics, Houston, TX, May, 2010.

438. “Correlation and relaxation effects near threshold in photoabsorption of the Ar isoelectronic Series,” J. Jose, G. B. Pradhan, V. Radojević, P.C. Deshmukh, and S. T. Manson, 41st Annual Meeting of the American Physical Society, Division of Atomic, Molecular and Optical Physics, Houston, TX, May, 2010.

439. “Photoionization of ground and excited states of Ca^+ and comparison along the isoelectronic sequence,” A.M. Sossah, H.-L. Zhou, S.T. Manson, 41st Annual Meeting of the American Physical Society, Division of Atomic, Molecular and Optical Physics, Houston, TX, May, 2010.

440. “Photoionization of potassium-like transition metal ions: Ti^{3+} to Fe^{7+} A.M. Sossah, H.-L. Zhou and S.T. Manson, 41st Annual Meeting of the American Physical Society, Division of Atomic, Molecular and Optical Physics, Houston, TX, May, 2010.

441. “Systematics of nondipole effects on photoelectron angular distributions for 3s and 4s photoionization in the region of quadrupole Cooper minima,” L. A. LaJohn, R. H. Pratt

and S. T. Manson, 41st Annual Meeting of the American Physical Society, Division of Atomic, Molecular and Optical Physics, Houston, TX, May, 2010.

442. "Effects of screening of the final-state A^+ ion static potential within the C_{60} on $A@C_{60}$ photoionization," V. Dolmatov, E. Guler and S. T. Manson, 41st Annual Meeting of the American Physical Society, Division of Atomic, Molecular and Optical Physics, Houston, TX, May, 2010.

443. "Suppression of confinement oscillations in photoionization cross sections of endohedral atoms," A.S. Baltenkov, U. Becker, S. T. Manson, and A. Z. Msezane, 41st Annual Meeting of the American Physical Society, Division of Atomic, Molecular and Optical Physics, Houston, TX, May, 2010.

444. "Inner Shell Photodetachment of Na^- Using The Multi-Configuration Tamm-Dancoff Approximation," J. Jose, G. B. Pradhan, V. Radojević, S. T. Manson, and P.C. Deshmukh, 25th Symposium on the Physics of Ionized Gases, Donji Milanovac, Serbia, Aug., 2010.

445. "Ionization of Free and Confined Atoms and Ions," S. T. Manson, DOE Atomic, Molecular and Science (AMOS) Research Meeting, Warrenton, VA, Sept., 2010 (Invited Talk)

446. "Photoionization of Transition-Metal Ions," A. M. Sossah, H.-L. Zhou and S. T. Manson, Laboratory Astrophysics Workshop, Gatlinburg, TN, Oct., 2010.

447. "Correlation Study of Endohedrally Confined Atoms ($A@C_{60}$): Alkaline Earth Metal Elements," M. F. Hasoğlu, H.-L. Zhou and S. T. Manson, 42nd Annual Meeting of the American Physical Society, Division of Atomic, Molecular and Optical Physics, Atlanta, GA, June, 2011.

448. "Effects of core correlations on the photodetachment of Cu^-," J. Jose. G. B. Pradhan, G. Aravind , P.C. Deshmukh, V. Radojević' and S.T. Manson, 42nd Annual Meeting of the American Physical Society, Division of Atomic, Molecular and Optical Physics, Atlanta, GA, June, 2011.

449. "Dramatic quadrupole effects in the low-energy photoionization of the 3s subshell of atomic Mg," G. Pradhan, J. Jose, P.C. Deshmukh, S.T. Manson, L.A. LaJohn and R.H. Pratt, 42nd Annual Meeting of the American Physical Society, Division of Atomic, Molecular and Optical Physics, Atlanta, GA, June, 2011.

450. "Location of low-energy zeroes in bound-free quadrupole matrix elements and their systematics in comparison to quantum defects and phase shifts," L.A. Lajohn, R.H. Pratt, G. Pradhan, T. Banerjee, H. Varma, P.C. Deshmukh and S.T. Manson, 42nd Annual Meeting of the American Physical Society, Division of Atomic, Molecular and Optical Physics, Atlanta, GA, June, 2011.

451. "Photoionization of spherical fullerenes: Dependence of the strength and lifetime of plasmon resonances on the number of carbon atoms," M. McCune, R. De, H.

Chakraborty, M. E. Madjet and S. T. Manson, 42nd Annual Meeting of the American Physical Society, Division of Atomic, Molecular and Optical Physics, Atlanta, GA, June, 2011.

452. "Photoionization of bilayer fullerene onions," R. De, M. McCune, H. Chakraborty, M. E. Madjet and S. T. Manson, 42nd Annual Meeting of the American Physical Society, Division of Atomic, Molecular and Optical Physics, Atlanta, GA, June, 2011.

453. "Ionization of Atoms Confined in Fullerenes by Photons and Charged-Particle Impact," International Seminar on Atomic Cluster Collisions, Berlin, Germany, July, 2011 (invited talk).

454. "Dipole and Quadrupole Photoionization of Intermediate Subshells of Atomic Mercury," T. Banerjee, Hari R. Varma, P. C. Deshmukh, and S. T. Manson, International Conference on the Physics of Electronic and Atomic Collisions, Belfast, N. Ireland, July, 2011.

455. "Effect of Interchannel Coupling and Confinement on the Photoionization of Kr," J. George, Hari R. Varma, P. C. Deshmukh, and S. T. Manson, International Conference on the Physics of Electronic and Atomic Collisions, Belfast, N. Ireland, July, 2011.

456. "Dipole and quadrupole photodetachment/photoionization studies of the Ar isoelectronic sequence," J. Jose, G. B. Pradhan, V. Radojević, S. T. Manson, and P. C. Deshmukh, International Conference on the Physics of Electronic and Atomic Collisions, Belfast, N. Ireland, July, 2011.

457. "Photoionization of Endohedrally Confined Ca ($Ca@C_{60}$)," M. F. Hasoglu, P. Prabha, M. H. Javani, H. L. Zhou, and S. T. Manson, International Conference on the Physics of Electronic and Atomic Collisions, Belfast, N. Ireland, July, 2011.

458. "X-Ray Photoionization of Free and Confined Atoms," 4th International Workshop on Hard X-Ray Photoelectron Spectroscopy, Hamburg, Germany, Sept., 2011 (invited talk).

459. "Dramatic quadrupole effects in the low energy photoionization of the 4s subshell of free and confined Ca," S. Kannur, G. B. Pradhan, J. Jose, H. R. Varma, P. C. Deshmukh and S. T. Manson, 43rd Annual Meeting of the American Physical Society, Division of Atomic, Molecular and Optical Physics, Orange Co., CA, June, 2012.

460. "Photoionization of confined noble gas atoms: Hybridization and interchannel coupling effects," M. H. Javani, H. S. Chakraborty, and S. T. Manson, 43rd Annual Meeting of the American Physical Society, Division of Atomic, Molecular and Optical Physics, Orange Co., CA, June, 2012.

461. "Photoionization of the $Zn@C_{60}$ endofullerene: Atom-fullerene ground-state orbital hybridization of d-d character," J. Maser, M. Javani, R. De, M. Madjet, H. Chakraborty, and S. T. Manson, 43rd Annual Meeting of the American Physical Society, Division of Atomic, Molecular and Optical Physics, Orange Co., CA, June, 2012.

462. “Valence photoionization of small alkaline earth atoms endohedrally confined in C_{60}: From the many-electron collectivity to single-electron interferences,” M. Javani, M. Mccreary, A. Patel, M. Madjet, H. Chakraborty, and S. T. Manson, 43rd Annual Meeting of the American Physical Society, Division of Atomic, Molecular and Optical Physics, Orange Co., CA, June, 2012.

463. “Photoionization of free and confined Mg : Evolution of the cross section with depth of the confining well,” P. Padukka, H.-L. Zhou, and S.T. Manson, 43rd Annual Meeting of the American Physical Society, Division of Atomic, Molecular and Optical Physics, Orange Co., CA, June, 2012.

464. “Radiation Damping in the Photoionization of Fe^{14+},” T. W. Gorczyca, M. F. Hasoglu, M. A. Bautista, Z. Felfli, and S. T. Manson, 43rd Annual Meeting of the American Physical Society, Division of Atomic, Molecular and Optical Physics, Orange Co., CA, June, 2012.

465. “$2s \rightarrow np$ Autoionizing Resonances of the Neon Isoelectronic Sequence using RRPA and RMQDT,” N. Madugula, M. V. Rundhe, G. Aravind, P. C. Deshmukh, and S. T. Manson, 43rd Annual Meeting of the American Physical Society, Division of Atomic, Molecular and Optical Physics, Orange Co., CA, June, 2012.

466. “Plasmon-plasmon coupling in buckyonion fullerenes: Photoexcitation of interlayer plasmonic cross modes,” M. McCune, R. De, M. Madjet, H. Chakraborty, and S.T. Manson, 43rd Annual Meeting of the American Physical Society, Division of Atomic, Molecular and Optical Physics, Orange Co., CA, June, 2012.

467. “Time delay in photoionization near Cooper minima,” J. Jose, S. Kannur, A. Kumar, H. R. Varma, P. C. Deshmukh,and S. T. Manson, 43rd Annual Meeting of the American Physical Society, Division of Atomic, Molecular and Optical Physics, Orange Co., CA, June, 2012.

468. “Inner-shell Photoionization of Atomic Chlorine: Experiment and Theory,” 44th Annual Meeting of the American Physical Society, Division of Atomic, Molecular and Optical Physics, Quebec City, Canada, June, 2013.

469. “Photoionization of Endohedral Atoms Using R-matrix Methods: Application to $Xe@C_{60}$,” 44th Annual Meeting of the American Physical Society, Division of Atomic, Molecular and Optical Physics, Quebec City, Canada, June, 2013.

470. “Resonant inter-Coulombic decay processes from atom to fullerene and backward in the photoionization of $Ar@C_{60}$,” 44th Annual Meeting of the American Physical Society, Division of Atomic, Molecular and Optical Physics, Quebec City, Canada, June, 2013.

471. “Structure generated by interchannel coupling in high-energy photoionization,” 44th Annual Meeting of the American Physical Society, Division of Atomic, Molecular and Optical Physics, Quebec City, Canada, June, 2013.

472. “Theoretical Study of the Photoionization of small fullerenes C_n (n=28, 32, 40, 44, 50)

using the Time-Dependent-Local-Density Approximation (TDLDA)," 44th Annual Meeting of the American Physical Society, Division of Atomic, Molecular and Optical Physics, Quebec City, Canada, June, 2013.

473. "Time Delay in the Photoionization of Xenon: Relativistic Effects," 44th Annual Meeting of the American Physical Society, Division of Atomic, Molecular and Optical Physics, Quebec City, Canada, June, 2013.

474. "Analysis of resonances for the inner-shell 2p photoionization of Mg," 44th Annual Meeting of the American Physical Society, Division of Atomic, Molecular and Optical Physics, Quebec City, Canada, June, 2013.

475. "Atomic Photoionization of Ba 5s using Relativistic Random Phase Approximation *with* Relaxation," 44th Annual Meeting of the American Physical Society, Division of Atomic, Molecular and Optical Physics, Quebec City, Canada, June, 2013.

476. "Photoionization studies of $Cd@C_{60}$," 44th Annual Meeting of the American Physical Society, Division of Atomic, Molecular and Optical Physics, Quebec City, Canada, June, 2013.

477. "Theoretical Studies of the Photoionization of Free and Endohedral Fullerene Molecules," Sixth International Symposium "Atomic Cluster Collisions," Wuhan-Chongqing, China, July, 2013 (invited paper).

478. "Atom-fullerene forward and backward inter-Coulombic decay (ICD) resonances in the photoionization of $Ar@C_{60}$," 27^{th} International Conference on Photonic, Electronic and Atomic Collisions, Lanzhou, China, July, 2013.

479. "Photoionization of bonding and antibonding-type atom-fullerene hybrid states: $Zn@C_{60}$ versus $Cd@C_{60}$," 27^{th} International Conference on Photonic, Electronic and Atomic Collisions, Lanzhou, China, July, 2013.

480. "Photoionization of helium inside small fullerenes ($He@C_{28}$, C_{32}, C_{40}, C_{44}, C_{50})," 27^{th} International Conference on Photonic, Electronic and Atomic Collisions, Lanzhou, China, July, 2013.

481. "Photoionization of $Xe@C_{60}$ using R-matrix Methods," 27^{th} International Conference on Photonic, Electronic and Atomic Collisions, Lanzhou, China, July, 2013.

482. "Relativistic effects in time delay in the neighborhood of Cooper minima: Evolution as a function of Z," 27^{th} International Conference on Photonic, Electronic and Atomic Collisions, Lanzhou, China, July, 2013.

483. "Effect of confinement and interchannel coupling on high-Z atoms," 27^{th} International Conference on Photonic, Electronic and Atomic Collisions, Lanzhou, China, July, 2013.

484. "On the differences in double ionization of atoms by particles and antiparticles," 27^{th} International Conference on Photonic, Electronic and Atomic Collisions, Lanzhou,

China, July, 2013.

485. "Photoabsorption by Free and Confined Atoms and Ions," Department of Energy Atomic Molecular and Optical Science (AMOS) Research Meeting, Potomac, MD, October, 2013 (invited paper).

486. "Attosecond time delay and confinement resonances in photoionization of endohedral atoms: Xe@C_{60}, Gordon Research Conference on Photoionization, Galveston, TX, Feb., 2014.

487. "Double Ionization in Ion-Atom Collisions: Mechanisms and Scaling," Conference on the Application of Accelerators in Research and Industry (CAARI) 2014, San Antonio, TX, June, 2014.

488. "Probing confinement resonances by photoionizing Xe inside a C_{60}^+ molecular cage," 45th Annual Meeting of the American Physical Society, Division of Atomic, Molecular and Optical Physics, Madison, WI, June, 2014.

489. "Lifetimes and Fano asymmetry parameters of inter-Coulombic decay resonances in photoionization of Ar@C_{60}," 45th Annual Meeting of the American Physical Society, Division of Atomic, Molecular and Optical Physics, Madison, WI, June, 2014.

490. "Attosecond time delay and confinement resonances in photoionization of endohedral atoms: Xe@C_{60}," 45th Annual Meeting of the American Physical Society, Division of Atomic, Molecular and Optical Physics, Madison, WI, June, 2014.

491. "Relativistic Effects in the Photoionization of High-Z Confined Atoms: Rn@C_{60}," 45th Annual Meeting of the American Physical Society, Division of Atomic, Molecular and Optical Physics, Madison, WI, June, 2014.

492. "Inner-Shell 2p Photoionization of Free and Confined Mg : Evolution of the Resonances with Depth of the Confining Potential," 45th Annual Meeting of the American Physical Society, Division of Atomic, Molecular and Optical Physics, Madison, WI, June, 2014.

493. "New resonances from the coherence of Auger and intercoulombic (ICD) processes in the photoionization of endohedral fullerenes," 45th Annual Meeting of the American Physical Society, Division of Atomic, Molecular and Optical Physics, Madison, WI, June, 2014.

494. "Molecular Calculations of the Photoionization of Endohedral Atoms: Ar@C_{60}," 45th Annual Meeting of the American Physical Society, Division of Atomic, Molecular and Optical Physics, Madison, WI, June, 2014.

495. "Empirical Formulae and Scalings for the 1^{st} and 2^{nd} order contributions to Double Ionization of Helium," 6^{th} Conference on Elementary processes in Atomic Systems-CEPAS 2014, Bratislava, Slovakia, July, 2014.

496. "Photoabsorption of atoms and ions in the Far UV," Laboratory Astrophysics for Beyond

Hubble: fundamental processes from the NIR to the FUV, Pine Mountain, Georgia, March, 2015 (invited paper).

496. "Model Potentials for a C_{60} Shell," S. T. Manson, A, S. Baltenkov and A. Z. Msezane, Seventh International Conference on Dynamic Systems and Applications, Atlanta, GA, May, 2015.

497. "Giant Autoionization resonance enhancement and term-dependence of photoionization time delay in half-filled subshell atoms: the Mn atom," V. K. Dolmatov, A. Kheifets, S. T. Manson and P. C. Deshmukh, 46th Annual Meeting of the American Physical Society, Division of Atomic, Molecular and Optical Physics, Columbus, OH, June, 2015.

498. "Time delay in photoionization in Ne: Effect of different types of correlation," A. Mandal, S. Saha, N. N. Dutta, A. Ganesan, P.C. Deshmukh, V.K. Dolmatov, A.S. Kheifets, S.T. Manson, 46th Annual Meeting of the American Physical Society, Division of Atomic, Molecular and Optical Physics, Columbus, OH, June, 2015.

499. "Electron correlation effects in time delay in photoionization process: Mercury," A. Ganesan, S. Saha, A. Mandal, N. N. Dutta, P. C. Deshmukh and S. T. Manson, 46th Annual Meeting of the American Physical Society, Division of Atomic, Molecular and Optical Physics, Columbus, OH, June, 2015.

500. "Electron correlation and relativistic effects in photoabsorption processes of heavy closed shell atoms: Intermediate shells of Mercury," T. Banerjee, P.C. Deshmukh and S.T. Manson, 46th Annual Meeting of the American Physical Society, Division of Atomic, Molecular and Optical Physics, Columbus, OH, June, 2015.

501. "Photoionization of the 4d subshell of the La isonuclear sequence," S. Kalyadan, H. R. Varma, P. C. Deshmukh, J.T. Costello, P. Hayden and S.T. Manson, 46th Annual Meeting of the American Physical Society, Division of Atomic, Molecular and Optical Physics, Columbus, OH, June, 2015.

502. "Model Potentials for a C_{60} Shell," A. S. Baltenkov, S. T. Manson and A.Z. Msezane, 46th Annual Meeting of the American Physical Society, Division of Atomic, Molecular and Optical Physics, Columbus, OH, June, 2015.

503. "K-shell photoionization of Cl: Theory and experiment," Z. Felfli, S. Manson and A. Z. Msezane, 46th Annual Meeting of the American Physical Society, Division of Atomic, Molecular and Optical Physics, Columbus, OH, June, 2015.

504. "Relativistic Effects in the Photoionization of Very Heavy Atoms," D. A. Keating, S. T. Manson and P. C. Deshmukh, 46th Annual Meeting of the American Physical Society, Division of Atomic, Molecular and Optical Physics, Columbus, OH, June, 2015.

505. "Intercoulombic decay (ICD) resonances in the photoionization of noble gas endo-fullerene nanomolecules," Mohammad Javani, Maia Magrakvelidze, Ruma De, Steven T. Manson and Himadri Chakraborty, International Symposium on Atomic Collisions in

Clusters, Madrid, Spain, July, 2015.

506. "Wigner time delay studies of the photoionization of atomic zinc and cadmium," S. Saha, A. Mandal, P. C. Deshmukh, A. Kheifets, V. K. Dolmatov and S. T. Manson, 29th International Conference on Photonic, Electronic and Atomic Collisions, Toledo, Spain, July, 2015.

507. "Time delay in photoionization of half-filled shell atoms," V. K. Dolmatov, A. S. Kheifets, S. T. Manson and P. C. Deshmukh, 29th International Conference on Photonic, Electronic and Atomic Collisions, Toledo, Spain, July, 2015.

508. "Wigner time delay in quadrupole photoionization channels in atomic Hg," A. Mandal, S. Saha, T. Banerjee, P. C. Deshmukh, A. Kheifets, V. K. Dolmatov and S. T. Manson, 29th International Conference on Photonic, Electronic and Atomic Collisions, Toledo, Spain, July, 2015.

509. "Effect of coulomb confinement resonances on time delay in $Ne@C_{60}^{-5}$," A. Kumar, H. R. Varma, P. C. Deshmukh, S. T. Manson, V. K. Dolmatov and A. S. Kheifets, 29th International Conference on Photonic, Electronic and Atomic Collisions, Toledo, Spain, July, 2015.

510. "Multiple Cooper minima in ground state E2 photoionization of high Z atoms," T. Banerjee, A. Mandal, P. C. Deshmukh and S. T. Manson, 29th International Conference on Photonic, Electronic and Atomic Collisions, Toledo, Spain, July, 2015.

511. "Possible Evidence of 3rd and 4th order Contributions to Double Ionization of Helium by Protons and Antiprotons," A. C. F. Santos, R. D. DuBois†, and S. T. Manson, 29th International Conference on Photonic, Electronic and Atomic Collisions, Toledo, Spain, July, 2015.

512. "Auger-intercoulombic hybridized decay resonances in $Kr@C_{60}$," M. Magrakvelidze, R. De, S. T. Manson and H. S. Chakraborty, 29th International Conference on Photonic, Electronic and Atomic Collisions, Toledo, Spain, July, 2015.

513. "Confinement Effects On Spin-Orbit Activated Interchannel Coupling," D. A. Keating, P. C. Deshmukh and S. T Manson, 29th International Conference on Photonic, Electronic and Atomic Collisions, Toledo, Spain, July, 2015.

514. "Shape of Model Potentials for a C_{60} Shell," S. T. Manson, A. S. Baltenkov, and A. Z. Msezane, 29th International Conference on Photonic, Electronic and Atomic Collisions, Toledo, Spain, July, 2015.

515. "K-shell Photoionization of Atomic Cl," Z. Felfli, S. T. Manson and A. Z. Msezane, 29th International Conference on Photonic, Electronic and Atomic Collisions, Toledo, Spain, July, 2015.

516. "Photoionization of the 2p subshell in the Ar isonuclear sequence," Aarthi Ganesan, Sudha Deshmukh, Jobin Jose, Gagan B. Pradhan, Vojislav Radojevic, Pranawa C.

Deshmukh and Steven T. Manson, 29th International Conference on Photonic, Electronic and Atomic Collisions, Toledo, Spain, July, 2015.

517. "Inner-shell autoionization resonances along Mg isoelectronic sequence," K. Sindhu, H. R. Varma, P. C. Deshmukh and S. T. Manson, 29th International Conference on Photonic, Electronic and Atomic Collisions, Toledo, Spain, July, 2015.

518. "Nondipole and Interchannel Coupling Effects in X-Ray Photoionization: A Tribute to Dennis Lindle," Steven T. Manson, PACIFICHEM 2015, Honolulu, HI, December, 2015 (invited paper).

519. "Concluding Remarks – Looking Ahead," S. T. Manson, 10^{th} Symposium, Atomic and Molecular Physics Group, IIT Madras, Chennai, India, March, 2016 (invited paper).

520. "Electron correlation effects on photoionization time delay in atomic Ar and Xe," A. Ganesan, S. Saha, P. C. Deshmukh, S. T. Manson and A. S. Kheifets, 47th Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics, Providence, RI, May, 2016.

521. "Angular dependence of Wigner time delay: Relativistic Effects," A. Mandal, P. C. Deshmukh, S. T. Manson and A. S. Kheifets, 47th Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics, Providence, RI, May, 2016

522. "Wigner time delay in photodetachment of negative ions," S. Saha, P. C. Deshmukh, J. Jose, A. S. Kheifets andS. T. Manson, 47th Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics, Providence, RI, May, 2016.

523. "Spin-Orbit Activated Confinement Resonances," David Keating, Steven Manson and Pranawa Deshmukh, 47th Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics, Providence, RI, May, 2016

524. "Inter-Coulombic decay (ICD) of endofullerene inner-vacancies in coherence with the Auger decay," Maia Magrakvelidze, Ruma De, Mohammad Javani, Mohamed Madjet, Steven T. Manson and Himadri Chakraborty, 47th Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics, Providence, RI, May, 2016

525. "Coherence of inter-Coulombic (ICD) and electron transfer mediated (ETMD) decay in endofullerenes," Ruma De, Maia Magrakvelidze, Mohamed Madjet, Steven T. Manson and Himadri Chakraborty, 47th Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics, Providence, RI, May, 2016.

526. "Correlation-induced Time Delay in Atomic Photoionization," David A. Keating, Steven T. Manson, Pranawa C. Deshmukh and Anatoli S. Kheifets, 47th Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics, Providence, RI, May, 2016.

527. "Wigner time delay near dipole photoionization Cooper minima: Effects of quadrupole channels," Ankur Mandal, Pranawa C Deshmukh, Anatoli Kheifets and Steven T Manson, 25^{th} International Conference on Atomic Physics (ICAP), Seoul, Korea, July,

2016.

528. “Understanding Complexity in the Photoionization of Free and Confined Atoms,” Steven T. Manson, Atomic, Molecular and Optical Science (AMOS) Research Meeting of the US Department of Energy, Gaithersburg, MD, Oct., 2016 (invited paper).

COLLOQUIA PRESENTED AT OTHER INSTITUTIONS: (updated 04/28/15)

l. "Theory of Autoionization," Mt. Holyoke College, South Hadley, MA, Nov., 1966.

2. "Photoionization Calculations in Atoms," National Bureau of Standards, Washington, DC, Apr., 1967.

3. "Theories of Photoionization," University of Delaware, Newark, DE, Apr., 1968.

4. "Interchannel Coupling in Photoionization," Lawrence Radiation Laboratory, Livermore, CA, Apr., 1968.

5. "The Auger Effect in Inner Atomic Shells," Georgia Institute of Technology, Atlanta, GA, Mar., 1969.

6. "Inelastic Electron-Alkali Atom Collisions," Georgia State University, Atlanta, GA, May, 1970.

7. "Inner Shell Ionization Phenomena," Georgia Institute of Technology, Atlanta, GA, May, 1970.

8. "Angular Distribution of Atomic Photoelectrons," Georgia State University, Atlanta, GA, Oct., 1970.

9. "Photoionization of Noble Gases," Emory University, Atlanta, GA, Nov., 1970.

10. "Atomic Photoionization Calculations," University of Georgia, Athens, GA, Nov, 1970.

11. "Ionization of Atoms by Radiation," University of Alabama, Tuscaloosa, AL, 1971.

12. "Ionization of Atoms by Fast Charged Particles," University of Chicago, Chicago, IL, Nov., 1972.

13. "Atomic Collisions Research at GSU," Argonne National Laboratory, Argonne, IL, Nov., 1972.

14. "Interaction of Radiation with Matter," Battelle Northwest Laboratory, Richland, WA, Jun., 1972.

15. "Photoelectron Angular Distributions - Where Do We Go From Here?" Argonne National Laboratory, Argonne, IL, Oct., 1972.

16. "Ionization in Atomic Collisions," Clemson University, Clemson, SC, Feb., 1973.

17. "Photoionization and Photoelectron Angular Distributions," University of Missouri, Rolla, MO, Mar., 1973.

18. "Photoionization of Positive Ions," Edgewood Arsenal, Aberdeen, MD, Jan., 1974.

19. "Ionization of Atoms by Fast Charged Particles," Auburn University, Auburn, AL, May, 1974.

20. "Photoionization and Photoelectron Angular Distributions," Ohio State University-Battelle Chemical Physics Group, Columbus, OH, Mar., 1975.

21. "Calculation of Photoionization Cross Sections," Edgewood Arsenal, Aberdeen, MD, Apr., 1975.

22. "Ionization of Atoms by Fast Charged Particles," University of Western Ontario, London, Canada, Feb., 1976.

23. "Photoabsorption by Excited States of Atoms," Oak Ridge National Laboratory, Oak Ridge, TN, Oct., 1976.

24. "Photoionization of Open-Shell Atoms," Clemson University, Clemson, SC, Feb., 1977.

25. "Charged Particle Impact Ionization of Atoms," University of Georgia, Athens, GA, Oct., 1977.

26. "Atomic Photoelectron Spectroscopy," Louisiana State University, Baton Rouge, LA, Nov., 1977.

27. "Photoionization and Photoelectron Spectroscopy," University of Nebraska, Lincoln, NE, Dec., 1977.

28. "Atomic Photoionization and Photoelectron Spectroscopy," University of Connecticut, Storrs, CN, Jan., 1978.

29. "Electron Spectroscopy of Charged Particle Collisions," University of South Carolina, Columbia, SC, Feb., 1978.

30. "Photoionization and Photoelectron Spectroscopy of Atoms," University of Tennessee, Feb., 1978.

31. "Theory of Photoionization and Photoelectron Spectroscopy," University of Alberta, Edmonton, Alberta, Canada, Mar., 1978.

32. "Interaction of Radiation with Matter," Auburn University, Auburn, AL, May, 1978.

33. "Relativistic Effects in Photoionization," Johns Hopkins University, Baltimore, MD, Oct., 1979.

34. "Photoionization of Open-Shell Atoms," Brooklyn College, Brooklyn, NY, Nov., 1979.

35. "Electron Ejection in Ion-Atom Collisions," University of Alabama, Birmingham, AL, May, 1981.

36. "Relativistic Effects in Photoionization," Georgia Institute of Technology, Atlanta, GA, May, 1981.

37. "Theories of Ion-Atom Collisions," North Carolina State University, Raleigh, NC, Nov., 1981.

38. "*Ab Initio* Calculations of Electron Ejection in Atomic Collisions," Oak Ridge National Laboratory, Oak Ridge, TN, Jan., 1983.

39. "Ion-Atom Collisions: The Born Approximation Rehabilitated," Texas A&M University, College Station, TX, Mar., 1983.

40. "Theories of Electron Ejection in Ion-Atom Collisions," University of Freiburg, Freiburg, W. Germany, Aug., 1983.

41. "Electron Emission in Ion-Atom Collisions: The Born Approximation Rehabilitated," University of Missouri, St. Louis, MO, Nov., 1983.

42. "Atomic and Molecular Photoionization: Where We Stand," Lawrence Livermore National Laboratory, Livermore, CA, Nov., 1985.

43. "The Photoionization of Atoms, Molecules, and Solids: The State of Our Knowledge," National Bureau of Standards, Gaithersburg, MD, Jan., 1986.

44. "Electron Ejection in Ion-Atom Collisions: The Born Approximation Rehabilitated," Georgia Institute of Technology, Atlanta, GA, Jan., 1986.

45. "Photoionization of Atoms and Molecules: Recent Progress and Problems," University of Hawaii, Honolulu, HI, Feb., 1986.

46. "Theoretical Studies of Ion-Atom Collisions," Atlanta University, Atlanta, GA, March, 1988.

47. "Photoionization of Unusual States of Atoms: Ions, Excited States and Open-Shell Atoms," Oak Ridge National Laboratory, Oak Ridge, TN, Sept., 1988.

48. "Photoionization of Unusual States," University of Missouri, St. Louis, MO, March, 1989.

49. "Photoionization of Atoms, Ions and Excited States," University of Georgia, Athens, GA, Feb., 1990.

50. "The Interaction of Light with Unusual States of Atoms," Emory University, Atlanta, GA, Feb., 1990.

51. "Photoionization of Atoms," Athens Atlanta Chemical Physics Group, Atlanta, GA, May, 1990.

52. "Photon Interactions with Atoms in Unusual States," Freie Universitat, Berlin, Germany, Sept., 1990.

53. "Studies of Atomic Photoionization with High Brightness Synchrotron Sources," University of Nebraska, Lincoln, NE, Oct., 1990.

54. "Simultaneous and Multiple Ionization Processes in Ion-Atom Collisions," University of Southern California, Los Angeles, CA, Feb., 1994.

55. "Photoionization of Unusual States of Atoms," University of Illinois, Urbana, IL, April, 1994.

56. "Many-Body Processes in Ion-Atom Collisions," Indian Institute of Technology, Madras, India, Dec., 1994.

57. "Photoionization of Atoms in Unusual States: Open-Shells, Ions and Excited States," Indian Institute of Technology, Madras, India, Dec., 1994.

58. "Modern Studies of Photoionization from Alpha to Omega," National Hellenic Institute, Athens, Greece, March, 1995.

59. "Atoms and Ions in a New Light: Modern Studies of Photoabsorption," Argonne National Laboratory, Argonne, IL, Sept., 1995.

60. "Atoms and Ions in a New Light: Modern Studies of Photoabsorption," Indian Institute of Technology, Madras, India, Dec., 1995.

61. "Atoms and Ions in a New Light: Modern Studies of Photoabsorption," Tata Institute for Fundamental Research, Bombay, India, Dec., 1995.

62. "The Interaction of Ionizing Radiation with Atoms and Ions," East Carolina University, Greenville, NC, Feb., 1996.

63. "Shedding Light on Atoms and Ions: Modern studies of Photoabsorption," University of Missouri, Rolla, MO, Feb., 1996.

64. "Photoabsorption Studies of Atoms and Ions," Emory University, Atlanta, GA, Nov., 1996.

65. "Atoms and Ions in a New Light: Modern Studies of Photoabsorption," Texas Christian University, Fort Worth, TX, May, 1997.

66. "New Phenomena in Photoabsorption by Atoms and Ions," Southern Illinois University, Carbondale, IL, Nov., 1997.

67. "Modern Studies of Photoabsorption," University of Tennessee, Knoxville, TN, Nov., 1997.

68. "Modern Studies of the Interaction of Electromagnetic radiation With Atoms and Ions," University of South Alabama, Mobile, AL, May, 1998.

69. "X-Ray Photoionization of Atoms and Ions: New Results and Breakdown of Fundamental Assumptions," Indian Institute of Technology-Madras, Chennai, India, Jan., 1999.

70. "The Interaction of X-Rays with Atoms and Ions," Tashkent State University, Tashkent, Uzbekistan, Feb., 1999.

71. "Breakdown of Fundamental Approximations in Photoionization," University of Georgia, Athens, GA, Sept., 1999.

72. "Recent Studies of Atomic and Ionic Photoionization," Indian Institute of Technology-Madras, Chennai, India, Jan., 2001.

73. "An Introduction to Photoionization," Indian Institute of Technology-Madras, Chennai, India, Jan., 2002.

74. "Photoionization of Atoms and Ions," Indian Institute of Technology-Madras, Chennai, India, Jan., 2002.

75. "Ionization of Atoms and Ions by Charged Particles," Indian Institute of Technology-Madras, Chennai, India, Jan., 2002.

76. "Core Level Photoionization of Negative Ions," University of Georgia, Athens, GA, Feb., 2002.

77. "Photoionization of Atoms and Ions, Positive and Negative," University of Paris, Paris, France, June, 2002.

78. "Studies of Photoionization: The Essential Physics of Theoretical Methodologies and How Well they Represent Reality," University of Paris, Paris, France, July, 2002.

79. "Photoionization of Free and Confined Atoms and Ions," University of Paris, Paris, France, July, 2002.

80. "Photoionizing Interactions in Matter," Indian Institute of Technology-Madras, Chennai, India, Feb., 2003.

81. "Probing Atoms and Ions with Photons," Auburn University, Auburn, AL, April, 2004.

82. "Theoretical Studies of the Photoionization of Free and Confined Atoms," Indian Institute of Technology-Madras, Chennai, India, Aug., 2004.

83. “Theoretical studies of the Photoionization of Free and Confined Atoms,” National Synchrotron Radiation Research Center, Hsinchu, Taiwan, Oct., 2005.

84. “Photoionization and Collisional Ionization of Atomic Systems,” Old Dominion University, Norfolk, VA, Feb., 2006.

85. “Photoionization Studies of Atomic Systems,” Western Michigan University, Kalamazoo, MI, April, 2007.

86. “Theoretical Studies of the Photoionization of Atomic Systems,” Michigan Technological University, Houghton, MI, April, 2007.

87. “Studies of Confined Atoms: Probing the Ultimate Nanostructure,” Northwest Missouri State University, Maryville, MO, Nov., 2007.

88. “What’s New in Atomic Physics-2011,” Indian Institute of Technology-Mandi, Mandi, India, March, 2011.

89. “The Joy of Being a Scientist,” Ajou University, Suwon, South Korea, May, 2012.

90. “Photoionization of Free and Confined Atoms,” Korea Atomic Research Institute, Daejon, South Korea, May, 2012.

91. “Studies of Photoabsorption by Free and Confined Atomic Systems: Recent Developments,” University of Nevada, Las Vegas, NV, February, 2013.

92. “Photoionization of Free and Confined Atomic Systems: Recent Developments,” Indian Institute of Technology-Madras, Chennai, India, March, 2013.

93. “Photoionization of Free and Confined Atoms,” Auburn University, Auburn, AL, Nov., 2014.

94. “Photoionization of Free and Confined Atoms,” Indian Institute of Technology—Mandi, India, March, 2015.

EXTRAMURAL FUNDING
(updated 12/30/16)

Steven T. Manson, Principal Investigator

National Science Foundation (NSF): Physics

05/73-10/76	$15,000	The Interaction of Radiation with Matter
06/77-05/82	$48,564	The Interaction of Radiation with Matter
05/82-05/85	$69,062	The Interaction of Radiation with Matter
06/85-11/88	$79,589	The Interaction of Radiation with Matter
06/89-11/91	$86,834	The Interaction of Radiation with Matter
06/91-10/94	$90,190 + $8,017 (GIFT Supplement)	The Interaction of Radiation with Matter
05/94-10/97	$112,137 + $35,000 (International Supplement, Uzbekistan)	The Interaction of Radiation with Matter
06/97-11/98	$25,000	The Interaction of Radiation with Matter
06/00-06/04	$60,000 + $19,000 (International Supplement, Uzbekistan/India)	The Interaction of Radiation with Atoms and Ions
05/03-08/07	$182,181	The Interaction of Radiation with Free and Confined Atoms
05/06-06/10	$90,000	The Interaction of Radiation with Free and Confined Atoms
09/09-08/16	$150,622 +$29,700 (Supplement)	The Interaction of Radiation with Free and Confined Atoms
TOTAL	$1,039,179 + $62,017 (Supplements)	

National Science Foundation: International

India:

04/93-09/95	$9,900 + 731,720 Rupees	
03/98-02/00	$12,000 + 818,367 Rupees	Ionization of Atoms by Radiation
03/02-12/07	$21,000	Relativistic Effects in Photoionization

Turkey:

	$19,800
	$8,300
	$9,950
TOTAL	$80,950 + 1,550,087 Rupees

TOTAL NSF FUNDING: $1,001,524 + 1,550,087 Rupees

National Aeronautics and Space Administration (NASA):

01/95-12/97	$93,000	Photoionization and Related Recombination Processes

01/98-12/98	$19,000	Photoionization and Related Recombination Processes
01/99-12/01	$146,100	Photoionization and Related Recombination Processes
01/03-12/05	$180,000	Photoionization, Recombination and Related Processes
01/06-1/10	$195,000	Photoionization, Recombination and Related Processes
TOTAL	$633,000	Complexity & Correlated Motion of Electrons

Department of Energy (DOE):

09/03-10/06	$110,550	Photoabsorption by Free and Confined Atoms and Ions
11/06-10/09	$150,000	Photoabsorption by Free and Confined Atoms and Ions
11/09-10/12	$209,451	Photoabsorption by Free and Confined Atoms and Ions
11/12-10/15	$240,000	Photoabsorption by Free and Confined Atoms and Ions
11/15-10/18	$270,000	
TOTAL	$980,001	

US Army Research Office (ARO):

06/74-05/77	$37,983
06/77-12/79	$75,000
01/80-02/83	$99,116
03/83-05/86	$136,299
06/86-05/89	$140,367
06/89-03/93	$168,030
TOTAL	$656,715

Academy of Applied Science (US Army):

81	$2,500	Research & Engineering Apprenticeship Program
82	$2,500	Research & Engineering Apprenticeship Program
83	$2,500	Research & Engineering Apprenticeship Program
84	$2,500	Research & Engineering Apprenticeship Program
85	$2,500	Research & Engineering Apprenticeship Program
86	$2,500	Research & Engineering Apprenticeship Program
87	$2,500	Research & Engineering Apprenticeship Program
88	$2,500	Research & Engineering Apprenticeship Program
89	$2,500	Research & Engineering Apprenticeship Program
90	$2,500	Research & Engineering Apprenticeship Program
91	$2,500	Research & Engineering Apprenticeship Program
92	$2,500	Research & Engineering Apprenticeship Program
93	$5,000	Research & Engineering Apprenticeship Program
94	$5,000	Research & Engineering Apprenticeship Program
95	$5,000	Research & Engineering Apprenticeship Program
96	$5,000	Research & Engineering Apprenticeship Program
97	$5,000	Research & Engineering Apprenticeship Program
98	$5,000	Research & Engineering Apprenticeship Program

99	$5,000	Research & Engineering Apprenticeship Program
00	$5,000	Research & Engineering Apprenticeship Program
01	$5,000	Research & Engineering Apprenticeship Program
02	$5,000	Research & Engineering Apprenticeship Program
03	$5,000	Research & Engineering Apprenticeship Program
04	$5,200	Research & Engineering Apprenticeship Program
05	$5,200	Research & Engineering Apprenticeship Program
06	$2,600	Research & Engineering Apprenticeship Program
07	$2,600	Research & Engineering Apprenticeship Program
08	$2,600	Research & Engineering Apprenticeship Program
09	$2,600	Research & Engineering Apprenticeship Program
10	$2,600	Research & Engineering Apprenticeship Program
11	$2,600	Research & Engineering Apprenticeship Program
12	$5,200	Research & Engineering Apprenticeship Program
13	$2,600	Research & Engineering Apprenticeship Program
14	$4,000	Research & Engineering Apprenticeship Program
15	$4,000	Research & Engineering Apprenticeship Program
16	$4,000	Research & Engineering Apprenticeship Program
17	$4,000	Research & Engineering Apprenticeship Program
TOTAL	$137,800	

North Atlantic Treaty Organization (NATO):

06/99-05/01	$12,359	Spectral Properties of Free and Confined Atoms

Civilian Research and Development Foundation (CRDF):

06/00-12/01	$45,000	Atomic & Molecular Spectra Beyond the Traditional Scope
05/02-04/04	$53,000	Atomic & Molecular Spectra Beyond the Traditional Scope
TOTAL	$98,000	

GRAND TOTAL $3,696,871 + 1,550,087 Rupees

Petrus C. Martens
Professor, Department of Physics & Astronomy
Georgia State University
http://joy.chara.gsu.edu/~martens/

Research: Founder and leader of the ***new interdisciplinary Solar-Stellar Informatics Cluster*** at GSU. The cluster aims to develop predictive capability for Space Weather and Space Climate through theory, simulations, and cutting edge data mining methods. Personal research interests include astrophysical dynamos, the Sun-Earth connection, coronal loops, solar flares, filament formation and eruptions, and the Faint Young Sun Paradox. NASA mission involvement with Yohkoh, SoHO, TRACE, and SDO.

Education and Postdoctoral Positions:

B.A. Astronomy	1977	University of Utrecht, The Netherlands
M.A. Astronomy	1979	University of Utrecht
Ph.D. Astrophysics	1983	University of Utrecht (Cum Laude)

Postdoc, Laboratory for Space Research, Utrecht University, 1983-1984
National Academy of Sciences-NRC Research Associate, NASA-GSFC, 1984-1987
Special Studies in Management and Administration, Harvard University Extension School, 1988-1990

Professional History:

2014 – Current:	Full Professor, Dept. of Physics & Astronomy, Georgia State University
2010 - 2014	Research Professor, Montana State University
2008 - 2009	Astrophysicist, Smithsonian Astrophysical Observatory
2004 - 2007	Research Professor, Physics Dept, Montana State University
1999 - 2004	Associate Research Professor, Montana State University
1993 - 1998	European Space Agency, SoHO Science Operations Coordinator
1990 - 1993	Lockheed Solar & Astrophysics Lab, Research Scientist
1987 - 1990	Harvard-Smithsonian Center for Astrophysics, Research Scientist

Current Synergistic Activities:

- Co-founder and Institutional PI for the Virtual Solar Observatory.
- Co-PI, "CIF21 DIBBs: Systematic Data-Driven Analysis and Tools for Spatiotemporal Solar Astronomy Data", $ 1.5 M NSF big data grant.
- International Council for Science; Co-Chair of the Committee on Solar Evolution & Extrema, a component of the SCOSTEP Science Focus for 2014-2018.
- Member Organizing Committee of the Solar Information Processing Workshops
- Member, Daniel K. Inouye Solar Telescope Science Working Group, 2013- current.
- Member, AAS e-Books Board, 2015-current
- PI, $ 1.3M NASA Grand Challenges Grant, "Data Driven 3D Dynamo Simulations for Cycle Forecasts"

Graduate Students: Current graduate students are Ricky Egeland (MSU), and Sushant Mahajan and Aparna Venkataramanasastry (GSU). Jointly supervising several GSU Computer Science graduate students.

Publications: Author and co-author of more than a hundred refereed scientific publications, many co-authored with students and postdocs. Edited two books. For a full list, see:
http://joy.chara.gsu.edu/~martens/index.php/publications/publications-2/

CURRICULUM VITAE

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Education:

Ph.D. University of Florida, Gainesville, Florida
(Physics) December, 1974
Major Advisor: Dr. Alex G. Smith
Dissertation: "Optical Brightness and Polarization of Quasars and Related Objects"
B.S. Birmingham-Southern College, Birmingham, Alabama
(Physics) May, 1968

Positions held:

Lecturer
Department of Physics and Astronomy
Georgia State University, Atlanta, Georgia
August 2012-Present

Visiting Lecturer
Department of Physics and Astronomy
Georgia State University, Atlanta, Georgia
2010-2012

Part-Time Instructor
Department of Physics and Astronomy
Georgia State University, Atlanta, Georgia
1977 to 2010

Adjunct Professor
Department of Mathematics and Science
Mercer University
Macon, Georgia
2009 to 2012

Postdoctoral Fellow
Georgia State University, Atlanta, GA
August, 1975 - August, 1977

Instructor
Work Evaluation Project
Santa Fe Community College, Gainesville, Florida
January, 1975 - August, 1975

Graduate Assistant
Department of Physics and Astronomy
University of Florida
Gainesville, Florida
1968 - 1970

Professional Societies:

American Astronomical Society
International Astronomical Union

Research Interests:

Nearby Stars.
Solar System Formation.

Teaching Experience:

Georgia State University:
- Astronomy of the Solar System
- Stellar and Galactic Astronomy
- Introduction to the Universe
- Integrated Science – Physical Sciences
- Physics of Music and Sound

Mercer University:
- Methods of Scientific Investigation
- Astronomy and the Universe
- Introduction to Physical Systems

University of Florida:
- Introductory Physics Labs

Service:

Hard Labor Creek Observatory:
- Host and supervise public Open House Night annually
- 2011 - 2016

Georgia Science Olympiad:
- Co-coordinator of Astronomy session of the Georgia State University Tournament, Division B, Grades 6 – 9.
- 2011 – 2016

Georgia Regional Astronomy Meeting
- Organizing Committee for 2016 Meeting

College of Arts and Sciences Academic Dishonesty Committee

Review appeals of charges of academic dishonesty and provide a recommendation to uphold or reject to the Dean of Arts and Sciences

2016 –

Undergraduate Astronomy Advisor

Advise students on pursuit of academic courses in Astronomy

Recommend whether to accept transfer credits in Astronomy from other colleges and universities

Manage summer intern program. Organize summer student presentation/report seminar.

2015 -

Research Experience:

Post Doctoral position at Georgia State University with Dr. H. R. Miller involving investigation of optical variability of active galactic nuclei. August, 1975 - August, 1977.

Refereed Publications:

Miller, H.R., Mullikin, T.L. and McGimsey, B.Q. 1983. Photoelectric Comparison Sequences in the Fields of Four BL Lacertae Objects. Astronomical Journal 88:1301.

Moore, R.L., Angel, J.R.P., Rieke, G.H., Labofsky, M.J., Wisniewski, W.Z., Mufson, S.L., Vrba, F.J., Miller, H.R., McGimsey, B.Q., and Williamon, R.M. 1980. Optical and Infrared Variability of B2 1308+3236. Astrophysical Journal 235:717.

Miller, H.R. and McGimsey, B.Q. 1979. 0246+18: A Variable Star Superposed on a Bright Galaxy. Publications of the Astronomical Society of the Pacific 91:161.

McGimsey, B.Q. and Miller, H.R. 1978. Historical Light Curves of Three QSO's. Astronomy and Astrophysics 31:147.

Miller, H.R. and McGimsey, B.Q. 1978. Photoelectric Intraday Observations of BL Lacertae, 3C 66A, B2 1652+39, and 3C 371. Astrophysical Journal 220:19.

McGimsey, B.Q. and Miller, H.R. 1978. Multiaperature Photometry of Peculiar Extragalactic Sources. Astrophysical Journal. 219:.387

Wingert, D.W., Miller, H.R., and McGimsey, B.Q. 1977. PKS 0735+17. International Astronomical Union Circular No. 3054.

McGimsey, B.Q. and Miller, H.R. 1977. Photoelectric Comparison Sequences in the Fields of Optically Active Extragalactic Objects. Astronomical Journal. 82:453.

Miller, H.R., McGimsey, B.Q., and Williamon, R.M. 1977. A Recent Photometric Investigation of the BL Lacertae Object B2 1101+38. Astrophysical Journal. 217:750.

McGimsey, B.Q., Miller, H.R., and Williamon, R.M. 1976. Photoelectric UBV Sequences in the Fields of Extragalactic Sources. Astronomical Journal. 81:750.

Miller, H.R., Wingert, D.W., McGimsey, B.Q., Anderson, E.S., Mullikin, T.L., and Folsom, G.H. 1976. On the Intraday Variability of OJ287. Astronomical Journal 81:298.

Scott, R.L., Leacock, R.J., McGimsey, B.Q., Smith, A.G., Edwards, P.L., Hackney, K.R., and Hackney, R.L. 1976. Optical Behavior of Sixty-four Extragalactic Radio Sources. Astronomical Journal 81:7.

McGimsey, B.Q., Smith, A.G., Scott, R.L., Leacock, R.J., Edwards, P.L., Hackney, R.L., and Hackney, K.R. 1975. Optical Behavior of Twenty Violently Variable Extragalactic Radio Sources. Astronomical Journal 80:895.

Smith, A.G., Scott, R.L., Leacock, R.J., McGimsey, B.Q., and Edwards, P.L. 1975. Four-Color Photometry of OJ 287 During Its Recent Three-Magnitude Decline. Publications of the Astronomical Society of the Pacific 87:149.

Andrew, B.H., Harvey, G.A. Medd, W.J., Hackney, K.R., Hackney, R.L., Scott, R.L., Smith, A.G., Leacock, R.J., McGimsey, B.Q., Epstein, E.E., Montgomery, J.W., Mottman, J., and Pomphrey, R.B., 1974. BL Lacertae (VRO 42.22.01): Simultaneous Radio and Optical Observations. Astrophysical Journal 191:51.

Papers and Posters Presented at Scientific Conferences:

McGimsey, B.Q., H.R. Miller, M.T. Carini, and J.W. Wilson. 1988. A Photometric Investigation of the Optical Variability of Markarian 501. Proceedings of the Georgia State University Conference on Active Galactic Nuclei. 170man.

Fiore, Rachel, McGimsey, Ben, and Wilson, John. 2016. Including Hands-On Instruction in a Science Lecture Course for Undergraduate Education Majors: Lessons Learned. National Conference on Science Education, Nashville, Vol. 2, 106.

Grants:

Dr. Rachel Fiore, Principal, Dr. Ben McGimsey, Dr. John Wilson, **"**Improving Learning Experiences in Physical Science of Elementary Education Majors through Collaboration between Faculty in the Colleges of Education and Arts and Sciences" Awarded by STEM, Georgia State University, $7,150.

Curriculum Vitae

A. G. Unil Perera

(http://www.phy-astr.gsu.edu/perera/index.html)

Home Address:
236, St. Martins Drive,
Mableton, GA 30126.
Phone: (770)-948-1505
Cell: (770)-309-3743
E-mail: phyuup@gmail.com
Citizenship: United States & Sri Lanka

Business Address
Department of Physics & Astronomy,
Georgia State University, Atlanta, GA 30303

Phone: (404)-413-6037
E-mail: uperera@gsu.edu

PRESENT POSITIONS

Regents' Professor of Physics, Georgia State University, 2012 –
Member, Editorial Board, IEEE Journal of Electron Device Society (j-EDS), 2012- 2018
Associate Editor: Sri Lanka Journal of Physics, 2011-
President, NDP Optronics LLC, 2002 -
Associate faculty: Institute of Neuroscience, Georgia State University, 2008-
Director, Interaction of Radiation with Matter Laboratory (IRML) 1996 September -

POSITIONS HELD

Professor of Physics, Georgia State University, 2001 –2012
Associate Chair, Physics & Astronomy, Georgia State University, September 2007 –2012 August
Graduate Director, Physics Program, Georgia State University, 1996 September – 2012 August
Visiting Research Professor, Institute of Fundamental Sciences, Sri Lanka, July 2000 -2008
Associate Professor, Georgia State University, (1996 – 2001)
Visiting Scientist, Institute for Microstructural Studies, National Research Council, Ottawa, Canada, (Aug. 1999-Sept. 1999)
Assistant Professor, Georgia State University, (1992 – 1996)
Research Assistant Professor, University of Pittsburgh, (1988- 1992)
Director of Research, Microtronics Associates Inc, (1990- 1992)
Research Associate, University of Pittsburgh, (May 1987- Dec. 1987)
Research Assistant, University of Pittsburgh, (1984-1987)
Teaching Assistant, University of Pittsburgh, (1982-1984)
Assistant Lecturer, University of Colombo, (1981-1982)

EDUCATION

Ph.D., University of Pittsburgh, April, 1987
M.S., University of Pittsburgh, 1983
B.S. (Physics - First Class Honors), University of Colombo, Sri Lanka, 1981

HONORS

- **Regents' Professorship** - 2013
- **Fellow** – Institute of Electrical and Electronics Engineers (IEEE) – 2012

- **"Lifetime Achievement Award - 2012"**, Sri Lanka Foundation, CA, USA.
- **"Alumni Distinguished Professor Award - 2010"**, Georgia State University (GSU).
- **"Carl R. Nave Award for Outstanding Teaching in Physics - 2009-2010"**, The Society of Physics Students (SPS), GSU.
- **"Outstanding Faculty Scholarship Award - 2008-2009"**, College of Arts and Sciences, GSU.
- **Fellow** – Society of Photo Instrumentation Engineers (SPIE) – 2009
- **Fellow** – American Physical Society – 2006
- "**Outstanding Faculty Achievement Award - 1999**", GSU.
- "**Outstanding Junior Faculty Award - 1995**", Faculty of Arts and Sciences, GSU.

ACADEMIC HONORS

- **Justin Samarasekara Medal for** "**The Most Outstanding Science Student of the Year -1981**", University of Colombo, Sri Lanka.

- "**First Year Science Student Fellowship - 1978/1979**", University of Colombo, Sri Lanka.

ACTIVE RESEARCH CONTRACTS & GRANT SUPPORT

EXTERNAL

- U.S. Army Research Office (ARO) W911NF-15-1-0018 "Extended-wavelength hot-carrier photodetectors from GaAs, Si to InAs/GaSb type-II structures", 8th December 2014 – 7th December 2019, $778,108 (PI: A. G. U. Perera).

- The National Science Foundation ECCS-1232184 "Novel Device Concepts for High Operating Temperature Split-Off Quantum Dot Infrared Photodetectors" Aug. 1, 2012 - July 31, 2017, $363,077 (PI: A. G. U. Perera).

INTERNAL

- Georgia-State University Chancellor's Initiative Fund, "Research in Interactions of Radiation with Matter", 07/01/05 - , $87,000 per year converted to permanent funding (PI: A. G. U. Perera, Co-PIs: Xiaochun He, S. Manson, M. Stockman, and N. Dietz).

PREVIOUS RESEARCH CONTRACTS & GRANT SUPPORT

EXTERNAL

- U.S. Army Research Office (ARO) W911NF-12-2-0035 "Band-Offset Characterizations of Semiconductor Heterojunctions", July 1, 2012 - June 30, 2016, $340,000 (PI: A. G. U. Perera).

- U.S. Army Research Office (ARO) W911NF-14-1-0197 "Equipment for Topographical Preparation and Analysis of Various Semiconductor Infrared Detector Samples", 12 May 2014 – 11 November 2015, $22,500 (PI: A. G. U. Perera).

- U.S. Army Research Office (ARO) W911NF-14-0235 "Internal Workshop on Quantum Structure Infrared Photodetectors – 2014 (QSIP 2014)", 1 June 2014 – 31 Aug 2015, $12,600 (PI: A. G. U. Perera).

- NSF “Research Experience for undergraduates (REU)”, supplement, 08/01/12-07/31/14, $8,400 (PI).

- Undergraduate/High school Research Apprenticeship Program (URAP/HRAP) for "Band-Offset Characterizations of Semiconductor Heterojunctions, US Army, June, 2013- September 30 2013, $3000.

- U.S. Army Research Office (ARO) W911NF-08-1-0448 “Uncooled Split-off Quantum Infrared Detectors for 3-5 micron Imaging Applications”, Nov. 1, 2008 - Oct. 31, 2012, $330,000 (PI: A. G. U. Perera).

- NDP Optronics LLC (President: A. G. U. Perera) - “Multi band Infrared Sensor” 06/01/10-05/31/11, $38,000.00 (GSU PI: Gamini Ariyawansa (Post Doc of A. G. U. Perera) , Project Director: V. Apalkov, a subcontract from the STTR Phase I grant awarded to NDP Optronics LLC from the U.S. Air Force, 06/01/10-05/31/11, $100,000.00).

- Air Force Office of Scientific Research (AFOSR): Defense University Research Instrumentation Program (DURIP) 55655-EL-DURIP “Ultraviolet to Far-Infrared Multi-Task Detector Characterization System”, 04/01/09 – 04/31/11, $115,000 (PI: A. G. U. Perera).

- National Science Foundation (NSF) - ECS 0553051 “Nanostructure based Terahertz Detector Development”, 04/01/06 - 03/31/11, $280,000+$45,000 (PI: A. G. U. Perera).

- National Science Foundation (NSF) “Research Experience for Teachers (RET)”, supplement, 04/01/09 - 12/31/10, $20,000 (PI: A. G. U. Perera).

- NDP Optronics LLC (President: A. G. U. Perera) - “Polarization Sensitive Bias-Selectable Dual-Band Quantum Dot Detectors” 12/01/08-11/31/10, $213,069.00 (GSU PI: Gamini Ariyawansa (Post Doc of A. G. U. Perera) , Project Director: V. Apalkov, a subcontract from the STTR Phase II grant awarded to NDP Optronics LLC from the U.S. Air Force, 12/01/08-11/31/10, $749,750.00).

- National Science Foundation (NSF) “Investigation of a Novel Quantum Dot Tunnel Detector for the Terahertz Range”, 09/01/06-08/31/09, $270,000 (PI: Pallab Bhattacharya – Univ. Michigan, Co- PI: A. G. U. Perera).

- National Science Foundation (NSF) Grant, OISE - 0543257, “QWIP 2006: International Conference on Quantum Well Infrared Photodetectors- 2006”, 10/01/05 - 09/30/08, $54,000 + $3,000 (PI: A. G. U. Perera).

- Georgia Research Alliance (GRA) Innovation Fund, GRA. IC07.C, “UV-IR Dual Band Detector Development”, 07/01/06 - 06/30/08, $100,000 (PI: A. G. U. Perera).

- NDP Optronics LLC - “UV-IR Dual Band Detectors” 4/01/06-3/31/08, $167,302 (President NDP & GSU PI: A. G. U. Perera, Co PI: Nikolaus Dietz, a subcontract from the SBIR Phase II grant awarded to NDP Optronics LLC from the U.S. Air Force, $750,000, 04/01/06-03/31/08).

- NDP Optronics LLC - “Dualband Polarization Sensitive Quantum Dot Detectors” 09/15/07-03/31/08, $31,302 (President NDP & GSU PI: A. G. U. Perera, Project Director: V. Apalkov, a subcontract from the STTR Phase I grant awarded to NDP Optronics LLC from the U.S. Air Force).

- National Science Foundation (NSF) "Development of Far-Infrared Difference Spectroscopy for Studies of Biological Pigment-Protein Complexes," 07/01/04 - 12/31/07, $231,438 (PI: Gary Hastings, A. G. U. Perera Co- PI).

- NASA – Jet Propulsion Laboratory – 1279663, "QWIP 2006: International Conference on Quantum Well Infrared Photodetectors- 2006", 12/1/05 - 12/31/07, $20,000 (PI).

- U.S. Air Force, FA9550-05-1-0493, "International Conference on Quantum Well Infrared Photo-detectors- 2006", 09/30/05 - 09/29/06, $16,000 (PI).

- National Science Foundation (NSF) "International Co-operative Research on Dye-Sensitized Structures", 9/1/03-8/31/07, $39,900+$2,775(PI).

- EPIR Technologies "International Conference on Quantum Well Infrared Photodetectors- 2006", 03/01/06 - 11/30/07, $10,000 (PI).

- U.S. Army, W911NF-05-1-0336 "International Conference on Quantum Well Infrared Photodetectors- 2006", 6/01/05 - 08/31/06, $10,000 (PI).

- NDP Optronics LLC, "UV-IR Dual Band Detectors", 4/15/05-1/15/06, $16,950 (President NDP & GSU PI: A. G. U. Perera, a subcontract from the SBIR Phase I grant awarded to NDP Optronics LLC from the U.S. Air Force, $99,000, 4/15/05-4/14/06)).

- NSF "Research Experience for undergraduates (REU)", supplement, 05/01/04-08/31/06, $8,000 (PI).

- National Science Foundation (NSF) Grant, INT 03 - 0322355, "US-Sri Lanka Cooperative Research: Study of dye-sensitized semiconductor nanostructure", 09/01/03 - 08/31/05, $39,900 + $5,000 (PI).

- National Science Foundation (NSF) Grant, ECS 01 - 40343, "Novel Heterojunction IR detectors", 9/1/02-8/31/05, $225,000 + $50,000 (PI).
- NSF "Research Experience for undergraduates (REU)", supplement, 12/1/02-08/31/05, $28,000 (PI).

- NSF "Research Experience for Teachers (RET)", supplement, 04/1/04-08/31/05, $12,000 (PI).

- NDP Optronics LLC, "Novel FIR Detectors with response up to 300 microns", 01/16/04-07/19/04, $9,960 (President NDP & GSU PI: A. G. U. Perera, a subcontract from the SBIR Phase I grant awarded to NDP Optronics LLC from NASA, $69,000,1/16/04-7/19/04).

- U.S. Army Battelle Scientific Service Program and NDP Optronics LLC, "Heterojunction infrared detector for 8- 20 μm range" Contract # DAAD19-02-D-0001, 8/8/02 - 07/08/03, $11,780 (PI).

- National Science Foundation (NSF) Grant, ECS 98 - 09746, "Quantum Well IR photo-detectors", 10/1/98-9/30/02, $180,000 +50,000 (PI).
- NSF "Research Experience for Undergraduates (REU) Supplement", 12/1/98 - 9/30/02, $24,000 (PI).

- State of Georgia through SEISMIC at Georgia Tech "Science experiments for elementary school kids", 9/1/01 - 8/31/02, $10,000 (Co-I).

- National Aeronautics and Space Administration (NASA) Grant, "Wavelength Tunable Novel FIR Detectors for ISR Astronomy Research", 7/1/97-12/31/01, $360,000 (PI).

- NSF "Student Participation Enhancement In Novel Interdisciplinary Technologies", 5/1/95 - 4/31/96, $5,000 (PI).

- National Science Foundation (NSF) Grant, ECS 94 - 12248, "Intraband Processes and New Device Concepts in Semiconductor Homo and Hetero Junctions", 8/01/94-7/31/98, $332,876 (PI).

- NSF "Research Experience for Undergraduates (REU) Supplement", 12/01/94 - 7/31/98, $30,000 (PI).

- NSF "High School Summer Teacher Supplement", 6/01/94 - 12/31/94, $8,012 (PI).

- NSF grant ECS - 9296238, "Intraband Processes and New Device Concepts" 8/15/92 - 12/31/94, $156,000 (PI).

- NSF "Research Experience for Undergraduates (REU) Supplement", 1/1/91 - 12/31/94, $6,000 (PI).

- U.S. DOE for "Search for Fractional Charge Impurities in Semiconductors", 6/1/92 - 5/31/93, $30,000 (Additional Investigator).

- U.S. Army CECOM for "Quantum Well IR Sources", 3/31/89 - 9/30/91, $432,000 (Co-PI with M. H. Francombe).

- NASA Jet Propulsion Laboratory (JPL) for "Heterostructure Infrared Devices for Use at Wavelengths Longer than 14 Microns", 7/27/90 - 7/26/92, $500,000 (Co-PI with M. H. Francombe).

- U.S. DOE for "A Search for Fractional Charge Impurities at the IR4 Beamline at NSLS", 6/1/91 - 5/31/92, $ 30,000 (PI).

- U.S. Air Force (5 Million dollar grant for 5 years) through the Pittsburgh Materials Research Center, Investigator: $68,000 grant for "Optoelectronics Device Development", 10/1/91 - 9/30/1992.
  Left University of Pittsburgh after the first year to take a position at GSU.

INTERNAL

- Seed grant from Brains & Behavior – Neuroscience program, "Development of Functional Near-Infrared Brain Imaging System", 07/01/09 - 06/30/10, $30,000 (PI: M. Dhamala, Co-PI: A. G. U. Perera).

- STEM Faculty Fellowship Grant, GSU STEM initiative, 02/01/09-06/30/10, $10,000 (PI: A. G. U. Perera).
- Georgia-State University Research Equipment Grant, "Magnetic Field Effects on Semiconductors leading to Novel Infrared and Spintronic Devices", 5/1/06 – 6/30/06 , $30,000 (PI: A. G. U. Perera, Co-PIs V. Apalkov, N. Dietz, B. Thoms and Xiaochun He).

- Georgia-State University Chancellor's Initiative Fund, "Research in Interactions of Radiation with Matter", 7/1/04 - 6/30/05, $87,000 (PI: A. G. U. Perera, Co-PIs Xiaochun He, S. Manson, W. H. Nelson, M. Stockman, and N. Dietz).

- Seed grant from Brains & Behavior –Neuroscience program, “Artificial Neural Networks with Silicon Circuits- Simulation and Parallel Computing”, 9/04-8/05, $16500 (PI: A. G. U. Perera, Co-PIs Yi Pan and Melody Moore).

- Seed grant from Brains & Behavior –Neuroscience program, “Terahertz response on Cells”, 9/04-8/05, $30,000 (PI: Vince Rehder, Co-PIs Nikolaus Dietz and A. G. U. Perera).

- Georgia-State University Chancellor's Initiative Fund, “Research in Interactions of Radiation with Matter”, 7/1/02 - 6/30/05, $162,000 (PI: A. G. U. Perera, Co-PIs Xiaochun He, S. Manson, W. H. Nelson, and N. Dietz).

- Georgia-State University Quality Improvement Program, “Enhancement of Low Temperature Data Acquisition for Optoelectronics Research", $20,910 (PI), Received March 1994.

- Georgia-State University Quality Improvement Program, “Enhancement of the Data Acquisition and Processing System for Semiconductor Optoelectronic Research”, $18,640 (PI), Received Feb 1993.

- Georgia-State University Chancellor's Initiative Fund, “Research in Interactions of Radiation with Matter”, 7/1/93 - 6/30/94, $60,000 (Co-PIs Gus Petitt, A. G. U. Perera, S. Manson, W. H. Nelson, and F. Hsu).

- Georgia-State University Chancellor's Initiative Fund, “Research in Interactions of Radiation with Matter”, 7/1/00 - 6/30/02, $150,000 (PI: A. G. U. Perera, Co-PIs Xiaochun He, S. Manson, W. H. Nelson, and Ershov).

- Georgia-State University Chancellor's Initiative Fund, “Research in Interactions of Radiation with Matter”, 7/1/99 - 6/30/00, $70,000 (PI: A. G. U. Perera, Co-PIs Xiaochun He, S. Manson, W. H. Nelson, and F. Hsu).

- Georgia-State University Chancellor's Initiative Fund, “Research in Interactions of Radiation with Matter”, 7/1/98 - 6/30/99, $70,000 (PI: A. G. U. Perera, Co-PIs Gus Petitt, S. Manson, W. H. Nelson, and F. Hsu).

- Georgia-State University Chancellor's Initiative Fund, “Research in Interactions of Radiation with Matter”, 7/1/97 - 6/30/98, $70,000 (PI: A. G. U. Perera, Co-PIs Gus Petitt, S. Manson, W. H. Nelson, and F. Hsu).

- Georgia-State University Chancellor's Initiative Fund, “Research in Interactions of Radiation with Matter”, 7/1/96 - 6/30/97, $60,000 (Co-PIs Gus Petitt, A. G. U. Perera, S. Manson, W. H. Nelson, and F. Hsu).

- Georgia-State University Chancellor's Initiative Fund, “Research in Interactions of Radiation with Matter”, 7/1/95 - 6/30/96, $49,000 (Co-PIs Gus Petitt, A. G. U. Perera, S. Manson, W. H. Nelson, and F. Hsu).

- Georgia-State University Chancellor's Initiative Fund, “Research in Interactions of Radiation with Matter”, 7/1/94 - 6/30/95, $60,000 (Co-PIs Petitt, Perera, Manson, Nelson, and Hsu).

PROFESSIONAL AFFILIATIONS

- **Life Fellow**: American Physical Society (APS)
- **Life Fellow**: Society of Photo Instrumentation Engineers (SPIE)
- **Life Fellow**: American Physical Society, Southeastern Section (SESAPS)
- **Fellow**: Institute of Electrical and Electronics Engineers (IEEE)
- **Fellow**: IEEE Photonics Society

OTHER PROFESSIONAL RECOGNITIONS

PARTICIPATION IN INTERNATIONAL COMMITTEES

- IEEE Electron Devices Society (EDS) Fellow nominations evaluator, 2015, 2016, 2017.
- Member: International Advisory Committee, International Conference on Microwave and Photonics (ICMAP 2015), Indian School of Mines, Dhanbad, India, 11-13 December, 2015.
- Member: Committee on International Scientific Affairs (CISA), American Physical Society, 2010-2014.
- Co-Chair: Quantum Structured Infrared Photodetector International Conference (QSIP 2014), Santa Fe, New Mexico, June 29-July 3, 2014.
- Member: Program Committee, Quantum Structured Infrared Photodetector International Conference (QSIP 2012), Cargese, France, June 17 - 22, 2012.
- Chair of Technical Program Committee, Nano-Optics, Nano-Photonics, and Nano-Optoelectronics, IEEE NANO 2012, Birmingham, United Kingdom, August 20 - 23, 2012.
- Member: Program Committee, International Conference on Advanced Materials Research (ICAMR-12), Colombo, Sri Lanka, July 01 - 04, 2012.
- Member: American Physical Society's Committee on International Scientific Affairs (CISA), January 01, 2012 – December 31, 2014.
- Member: Program Committee, 11th International Conference on Intersubband Transitions in Quantum Wells (ITQW 2011), Badesi, Italy, September 11 - 17, 2011.
- Chair of Program Committee, IEEE NANO 2011 – Nano-Optics, Nano-Photonics, and Nano-Optoelectronics, Portland, Oregon, August 15 - 18, 2011.
- Chair of Technical Committee (TC 4), IEEE NANO 2011 – Nanophotonics, Portland, Oregon, August 15 –18, 2011.
- International Advisory Committee, Seventh International Conference on Low Dimensional Structures and Devices (LDSD 2011), Telchac (Nuevo Yucatan, Mexico), May 22 – 27, 2011.

- Chair of Technical Committee (TC 4), IEEE NANO 2010 – Nanophotonics, Seoul, Korea, August 17 - 20, 2010.

- International Organizing Committee, QSIP (Quantum Structure Infrared Photodetectors) 2010, Istanbul, Turkey, August 15 - 20, 2010.

- International Program Committee, SPIE (Defense, Security and Sensing) 2010, Orlando, Florida, April 05 - 09, 2010.

- International Advisory Committee, the International Conference on Emerging Trends in Electronic and Photonic Devices and Systems (ELECTRO- 2009), Varanasi, India, December 22- 24, 2009.

- Local Co-Chair, SESAPS (Southeastern Section of American Physical Society) October Meeting, Atlanta, Georgia, November 11- 14, 2009.

- Co-Chair of Technical Committee (TC 4), IEEE NANO 2009 – Nanophotonics, Genoa, Italy, July 26 – 30, 2009.

- International Program Committee, QSIP (Quantum Structure Infrared Photodetector) 2009, Yosemite, California, January 18 - 23, 2009.

- International Advisory Committee, National Workshop on Advanced Optoelectronic Materials and Devices (AOMD-2008), Varanasi, India, December 22-24 2008.

- Chair of Award Committee (Young Investigator Award), 53rd DAE Solid State Physics Symposium (DAE-SSPS) 2008, Mumbai, India, December 16 - 20, 2008.

- Panel Member: Solid State Research and Future Directions, 53rd DAE Solid State Physics Symposium (DAE-SSPS) 2008, Mumbai, India, December 16 - 20, 2008.

- Co-Chair of Technical Committee (TC 4), IEEE NANO 2008 – Nanophotonics, Arlington, Texas, August 18 – 21, 2008.

- International Advisory Committee, WRA-LDSD (Workshop on Recent Advances of Low Dimensional Structures and Devices), Nottingham, UK, April 7-9, 2008.

- General and Program Committee Chair QWIP (International Workshop on Quantum Well infrared Photodetectors) 2006, Kandy, Sri Lanka, June 18-24, 2006.

- Treasurer& Member International Advisory Committee, QWIP (International Workshop on Quantum Well Infrared Photodetectors) 2004, the Canadian Rockies, August 2-5, 2004.

- International Program Committee, SPIE Conference on "Quantum Sensing, Evolution and Revolution from Past to Future", San Jose, CA, January 27-30, 2003.

- International Program Committee, IASTED international conference on "Neural Networks, NN 2000", Pittsburgh, PA, May 15-17, 2000.

- International Program Committee, IASTED international conference on "Artificial Intelligence, Expert Systems and Neural Networks", Honolulu, Hawaii, August 19-22, 1996.

- **Session Chair** –
  - Symposium B (Session -): Compound Semiconductors/Group V on Silicon, International Conference on Electronic Materials (IUMRS-ICEM 2016), July 4 - 8, 2016, Nanyang Technological University, Singapore, July, 4-8, 2016.
  - Session 3 (Part I), Advanced Infrared Technology and Applications, Pisa, Italy, Sept 29 – Oct 02, 2015.
  - Session 1-3, OSA Topical Conference: AOM 2014 – The 4th Advances in Optoelectronics and Micro/nano-optics, September 18-20, 2014, Xian, China.
  - Session- Nanophotonics: Plasmonic Nanostructures for Sensing and Emission, IEEE Nano 2011, Portland. OR, August 15- 19, 2011.
  - Session M2- (Quatum Well Infrared Photodetectors), Quantum Structure Infrared Photodetector (QSIP) 2010 International Conference, Istanbul, Turkey, August 15 - 20, 2010.
  - Session: "Energy Harvesting – II: Novel Materials, Nanoscale Devices and Applications", SPIE (Defense, Security, and Sensing) 2010, Orlando, Florida, April 05 - 09, 2010.
  - Session CB: "Novel Materials, Nanoscale Devices and Applications", SESAPS (Southeastern Section of American Physical Society) October Meeting, Atlanta, Georgia, November 11- 14, 2009.
  - Session WeP2-2 (Quantum Cellular Automata II – Oral Session), IEEE Nanotechnology Materials and Devices Conference (NMDC) - 2009, Traverse City, Michigan, June 2 - 5, 2009.
  - Session (Co-Chair) WeP1-2 (Quantum Cellular Automata I – Oral Session), IEEE Nanotechnology Materials and Devices Conference (NMDC) - 2009, Traverse City, Michigan, June 2 - 5, 2009.
  - Session T-2 (Dot-in-the-Well IR Detectors), Quantum Structure Infrared Photodetector (QSIP) 2009 International Conference, Yosemite, California, January 18 - 23, 2009.
  - Young Researcher Nominee Presentations, 53rd DAE Solid State Physics Symposium (DAE-SSPS) 2008, Mumbai, India, December 16 - 20, 2008.
  - Session Y36 (Artificial Neurons), APS March meeting, New Orleans, Louisiana, March 10 - 14, 2008.
  - Oral Session IV-3 (Application of Thin Films), Friday 28th September 2007, 6th International Conference on Thin Film Physics and Applications, Shanghai, China.
  - Session III: Nitrides-epitaxy, ICSSC -5 & PCCG-8 Conference, Zakopane, Poland, May 20-24, 2007.
  - Session 9: Quantum Sensing and Nano Photonics Devices: Detectors and Focal Plane Arrays III, SPIE, San Jose, CA, January 24, 2007**.**
  - Session WedB4: Novel Devices and components (Nano and Quantum devices, Photonic crystals): IRMMW-THz2006, Shanghai, China, September 18 - 22, 2006.
  - Session R17: APS March meeting, Baltimore, MD, March 13–17, 2006.
  - Session (Novel Directions): QWIP 2004 workshop, Kananaskis, Alberta, Canada, August 8-13, 2004.
  - Session (D8: FIAP): IR Applications of Semiconductor Nano & Micro Structure-I, Austin, Texas, March 3-7, 2003.
  - Session 4: Quantum Sensing: Evolution and Revolution From Past to Future, SPIE, San Jose, CA, 27 -30 Jan 2003.
  - Session (B8: FIAP): IR Applications of Semiconductor Nano & Micro Structures - I, APS, Indianapolis, March 18-22, 2002.
  - Symposium & Session (X9 & Y7: FIAP) on IR Applications of Semiconductor Quantum Structures, Semiconductor Optical Quantum Structures, APS, Seattle, Washington, March 12-16, 2001.
  - Session (QC 07: FIAP): Semiconductor Devices and Applications, Centennial American Physical Society March Meeting, Atlanta, March 20-26, 1999.

- **Editor** - IEEE Journal of Electron Devices Society, 2013-present.
- **Editor-** InTech Publications "Bolometers", ISBN: 9789535102359, 2012.
- **Editor-** A member of the editorial board of the Sri Lankan Journal of Physics (SLJP) for 2011 – 2013.
- **Editor-** "Proceedings of the Quantum Well Infrared Photodetectors – 2006", Elsevier, Infrared Physics & Technology, **50** ii-iii ISSN: 1350-4495 (2007).

- **Volume Co-Editor** - Academic Press "Handbook of Thin Film Devices, Vol **2**, Semiconductor Optical and Electro-Optical Devices", ISBN: 0-12-559760-7, 2000.
  Academic Press "Thin Films: Frontiers of Thin Film Technology", Vol **28**, ISBN 0-12-533028-6, 2000.

Our work on:

- The paper "Minimally invasive screening for colitis using attenuated total internal reflectance fourier transform infrared spectroscopy", J. Biophotonics, April, 2016, was highlighted on spectroscopy NOW.com, May 1st, 2016.
- The paper "Minimally invasive screening for colitis using attenuated total internal reflectance fourier transform infrared spectroscopy", J. Biophotonics, April, 2016, was highlighted on Medical News Today, 27th April 2016.
- The paper "Tunable hot-carrier photo detection beyond the band-gap spectral limit" Nature Photonics 8, 412–418 (2014), was selected to be the article in the May journal to have the Author interview "Hot-hole photodetectors", which is geared to explain the paper to a larger audience who may not be experts in the field.

- The paper "Tunable hot-carrier photo detection beyond the band-gap spectral limit" Nature Photonics 8, 412–418 (2014), was highlighted as one out of three titles in the cover of Nature Photonics.

- "QUANTUM-DOT DETECTORS: Dual-band QDIP is wavelength-selectable", *Laser Focus World* (a technical magazine devoted to the advances in optics, electro-optics, and optoelectronics), Volume 46, Issue 1, January 2010.

- Two of our papers (J. Appl. Physics, **97**, 093529, (2005) and Phys. Rev. B., **72**, 245326, (2005) are cited in the book "Properties of Semiconductor Alloys - Group-IV, III-V and II-VI Semiconductors" by Sado Adachi, Peter Capper, and Safa Kasap.

- Quantum Dot Detectors (five papers) and Plasmonic Midinfrared Detectors (one paper) were published in the ***Virtual Journal of Nanoscale Science & Technology***.

- Dual band (UV & IR) detector [APL 89, 091113, 2006] was reported as a news alert in the Compound Semiconductor net on 8th September 2006 published by IOP.

- Dual band (NIR & FIR) detector [APL, **86,** 143510, (2005)] was reported as a featured article in the June 2005 issue of PHOTONICS SPECTRA, TECHNOLOGY NEWS.

- Three color dot in a well detector was reported in December 2003 issue of LASER FOCUS WORLD, NEWSBREAKS, a technical magazine devoted to the advances in optics, electro-optics and optoelectronics.

- 70 μm heterojunction interfacial workfunction internal photoemission (HEIWIP) detector was reported in the newsbreaks June 2001 issue of the Laser Focus World.

- 35 micron cutoff wavelength Quantum Well Infrared Photodetectors was featured in the November 2000 issue of PHOTONICS SPECTRA, TECHNOLOGY WORLD BRIEFS, a technical magazine devoted to advances in optics, lasers, imaging, fiber optics, electro-optics and optoelectronics.

- Contributor, Section III, Electronics, "Comprehensive Dictionary of Physics", Published by CRC, Deepak Basu, editor-in-Chief, ISBN: 0-8493-2890-X, 2000.
- Our paper on HIWIP detectors (J. Appl. Phys. **77**, 915-924, (1995)) was selected to be included in the works "Selected papers on Infrared Detector Development" by Dr. Antoni Rogalski.

- Search for fractional charge impurities in semiconductors (PRL, 1993, Vol. 70, pp. 1053-1056) wais recorded in the "Review of Particle Properties", compiled by the particle data group at the Lawrence Berkeley Laboratory.

- Interfacial workfunction IR detectors (APL, 1992, Vol. 60, pp. 3168--3170) was featured in the August 1992 issue of the LASER FOCUS WORLD, NEWSBREAKS, a technical magazine devoted to the advances in optics, electro-optics and optoelectronics.

- Listed in **Marquis Who's Who** in America (2010, 64th Edition; 2009, 63rd Edition; 2008, 62nd Edition; 2007, 61st Edition; 2006, 60th Edition), Who's Who in the World (2010, 27th Edition; 2007, 24th Edition), Who's Who in South & Southwest (1999-2000, 26th Edition), Who's Who in Science & Engineering (2008-2009, 10th Edition; 2006-2007, 9th Edition; 2000-2001, 5th Edition).

- Outstanding Scholars of the 20th Century, IBC, Cambridge, UK and United Who's Who.

Community Recognitions:

- Volunteer Chaperone and Cultural Guide, Volunteered to chaperone and help guide a two week trip to Sri Lanka in which Harvard and Penn State students collaborated with the Sri Lankan Ministry of Health to conduct a medical relief trip. The students learned about the healthcare infrastructure, specific medical issues, procedures and challenges in Sri Lanka. (Harvard students were sponsored by the Weatherhead Center for International Affairs at Harvard University.) (Dec 23, 2014- Jan 3rd 2015).
- Director, Advanced Physics Camp, (34 students from Campbell High School International Baccalaureate (IB) Program, Smyrna GA) June 22- 26, 2009.

- Quoted in Marietta Daily Journal 1/03/2007, "Experts argue over danger of firing shots in air" a story on the speed of bullets and accidental shootings.

- Our UV-IR detector work related to NDP Optronics LLC was described in "SBIR Success Story" in the Georgia SBIR News letter.

- NDP Optronics LLC and University Commercialization listed in GSU Magazine, summer, 2006.

CONFERENCE PRESENTATIONS

- "Diagnostics Using Infrared Spectroscopy" International Conference on Sensing Technology (ICST 2017), Sydney, Australia, Dec 4-6, 2017**. (INVITED) (To be Presented)**
- "Infrared spectroscopy as a screening technique for colitis", Conference on "Bio-MEMS and Medical Microdevices III", May 8-10 2017, Barcelona, Spain. **(To be presented)**
- "Mid-Infrared detection in p-GaAs/AlGaAs heterostructures with a current blocking barrier", Fourth Conference on Sensors, MEMS and Electro-Optic Systems, 12-14 September, 2016, Skukuza, South Africa.
- "Extended threshold photo-detection in GaAs/AlGaAs split-off detectors at high temperatures" International Conference on Electronic Materials (IUMRS-ICEM 2016), July 4 - 8, 2016, Nanyang Technological University, Singapore. **(INVITED)**
- "Extended wavelength beyond the standard spectral response threshold at high operating temperature" SPIE Defense and Security Symposium, April 17-21, 2016, Baltimore, Maryland, USA. **(INVITED)**
- **INVITED KEYNOTE SPEECH**: "Hot Carrier Photodetectors", International Conference on Microwave and Photonics (ICMAP - 2015), December 11- 13, 2015, Indian School of Mines, Dhanbad, India. Dec 11-13, 2015.
- "Temperature Dependent Internal Photoemission Spectroscopic (TDIPS) Probe for Band-offset studies", II-VI Conference, October 7-10, 2015, Chicago, IL. **(INVITED)**
- "Tunable hot-carrier photodectectors", AITA 2015 - Advanced Infrared Technology and Applications, Pisa, Italy, Sept 29 – Oct 02, 2015. **(INVITED).**
- "Hot Carrier Infrared Photodetedtors", IEEE Summer Topicals Meeting on Mid Infrared Photonics, July 13-15, 2015, Nassau, Bahamas. **(INVITED)**
- "Tunable hot-carrier photodetectors for terahertz frequency operation", 26th International Symposium on Space Terahertz Technology, March 16-18, 2015, Harvard University, Cambridge, MA.
- "Hot-Carrier Photodetector beyond spectral limit ", 2014 Workshop on Innovative Nanoscale Devices and Systems (WINDS), November 30 – December 5, 2014, Kohala Coast, Hawaii, USA.
- "InAs/GaAs p-type quantum dot and dots-in-well infrared photodetectors", OSA Topical Conference: AOM 2014 – The 4th Advances in Optoelectronics and Micro/nano-optics, September 18-20, 2014, Xian, China. **(INVITED)**
- "InAs/GaAs p-type quantum dot and dots-in-well infrared photodetectors" The 14th International Conference on Nanotechnology (IEEE NANO 2014), 33 Gerrard Street West Toronto, ON, Canada, August 18-21, 2014.
- "InAs/GaAs p-type quantum dot infrared photodetector", Quantum Structured Infrared Photodetector (QSIP) International Conference, Santa Fe, New Mexico, June 29-July 3, 2014.
- "Low cost broadband (2-7 micron) infrared circular polarizer based on Ti doped Ag chiral nanorod structures", International Symposium on Advanced Nanodevices and Nanotechnology, Poipu Beach, Kauai, Dec. 8-13, 2013.

- "Oblique angle transmission spectroscopic measurements on InGaN/GaN dot-in-a-wire heterostructures", Nanotechnology for Defense, Tuscon AZ November 4-7, 2013.
- "Hot-carrier photodetector beyond spectral limit", A. G. U. Perera, Y. F. Lao, P. K. D. D. P. Pitigala, S. P. Khanna, L. H. Li, E. H. Linfield and H. C. Liu, IEEE Photonics 2013, Seattle, Washington, Sept 8-12, 2013. **(INVITED)**
- "Graded-barrier heterostructures for photovoltaic split-off infrared detection", IEEE Photonics 2012 (IPC12), Burlingame, California, September 23 - 27, 2012. **(INVITED)**
- "Bias and Polarization Selectable Multiband Sensors" International Conference on Advanced Materials Research (ICAMR-12), Colombo, Sri Lanka, July 01 - 04, 2012. **(INVITED)**
- Global Forum of Sri Lankan Scientists: Empowering Sri Lanka through Networking and Knowledge Sharing, Colombo, Sri Lanka, December 13 - 15, 2011. **(INVITED)**
- "Selectable Multi Band UV- IR sensing with Nanostructures", The IV International Nanotechnology Forum RUSNANOTECH 2011, Nanoelectronics and Nanophotonics session, Moscow, Russia, October 26 - 28, 2011. **(INVITED)**
- "Multiband Sensing with Arsenides and Nitrides", IEEE Photonics 2011 (IPC11), Arlington, Virginia, October 9 - 13, 2011. **(INVITED)**
- "Photo Detectors for Multi-Spectral Sensing", IEEE NANO 2011 – Nanosensors & Actuators: Optical Nanosensors, Portland, Oregon, August 15 - 18, 2011.
- "Polarization Agile selectable Multiband Infrared sensors", International Conference on Materials for Advanced Technologies (ICMAT 2011) and the 5th Asian Conference on Crystal Growth and Crystal Technology (CGCT-5), Singapore, June 26 - July 1, 2011. **(INVITED)**
- "Photodetectors for Wavelength-Selectable Multi-Band Sensing", 7th international conference on Low Dimensional Structures and Devices (LDSD 2011), Nuevo Yucatan, Mexican Caribbean, May 22 - 27, 2011.
- "Room Temperature Photovoltaic Operation of Graded Barrier Split-Off Band Infrared Detectors", (A. G. U. Perera, S. G. Matsik, D. P. Pitigala, E. Linfield, and H. C. Liu), Quantum Sensing and Nanophotonic Devices VIII, SPIE Photonics West 2011, San Francisco, California, January 22 - 27, 2011. **(INVITED)**
- "Effects of Graded Barriers on the Operation of Split-Off Band Infrared Detectors", (A. G. U. Perera, S. G. Matsik, M. S. Shishodia, P. K. D. D. P. Pitigala, R. C. Jayasinghe, E. Linfield, and H.C. Liu), QSIP (Quantum Structure Infrared Photodetector) 2010, Istanbul, Turkey, August 15 -20, 2010.
- "UV to Terahertz Detector Development", (A. G. U. Perera), The International Symposium on Optoelectronics Materials and Devices 2010, Chicago, IL, USA, July 12 - 13, 2010.
- "Spin Split-off Band Based High Operating Temperature IR Detectors in 3-5 μm and Beyond", (A. G. U. Perera, S. G. Matsik, M. S. Shishodia, R.C. Jayasinghe, and P. K. D. D. P. Pitigala), SPIE (Defense, Security, and Sensing) 2010, Orlando, Florida, April 05 - 09, 2010. **(INVITED)**
- "GaAs and GaN Based High Operating Temperature Spin Split-off band Infrared Detectors", (A. G. U. Perera, S. G. Matsik, M. S. Shishodia, and R. C. Jayasinghe), SPIE Photonics West 2010, San Francisco, California, January 23 - 28, 2010. **(INVITED)**
- "Nanoscale Quantum Structures for Infrared Detection (Wells, Dots, and Rings)", The Second Nanotechnology International Forum (Rusnanotech 2009), Moscow, Russia, October 6 - 8, 2009. **(INVITED)**
- "Multi-Color Infrared Sensing with Superlattice Quantum Dot Structures and Absorption

Enhancements", (A. G. U. Perera, G. Ariyawansa, M. S. Shishodia, G. Huang, P. Bhattacharya, M. Buchanan, Z. R. Wasilewski, and H. C. Liu), IEEE SENSORS 2009 Conference, Chirstchurch, Canterbury, New Zealand, October 25 - 28, 2009.

- "THz Sensors Based on Spin Orbit Split off Levels". A. G. U. Perera, P. V. V. Jayaweera, and S. G. Matsik. The 34th International Conference on Infrared, Millimeter, and Terahertz Waves (IRMMW-THz 2009), Busan, Korea, September 21 - 25, 2009.
- "GaN-Based Heterojunction Structures for Ultraviolet/Infrared Dual-Band Detection" (Perera, A. G. Unil, Jayasinghe, Ranga C., Ariyawansa, Gamini, Dietz, Nikolaus, Matsik, Steven G., Ferguson, Ian T., and Liu, Hui Chun), 2009 IEEE Nanotechnology Materials and Devices Conference (NMDC) 2009, Traverse City, Michigan, USA, June 2 - 5, 2009. **(INVITED)**
- **"**Polarization & Wavelength Agile Dual-Band Infrared Detectors**",** Joint Electronics Program Review**,** The Westin Arlington Gateway Hotel, Arlington, Virginia, May 27 - 29, 2009. **(INVITED)**
- "Grating-Coupled Polarization and Bias Sensitive Quantum Dot Detectors**",** 3rd Space-Based Sensing and Protection Conference, Kirtland Air Force Base, New Mexico, May 27 - 29, 2009. **(INVITED)**
- "Room temperature split-off band IR detectors for 3-5 μm and beyond" (A. G. U. Perera), Quantum Structure Infrared Photodetector (QSIP) 2009 International Conference, Yosemite, California, January 18 – 23, 2009.
- "Bias-Selectable Dual-Band Quantum Dot Infrared Photodetectors" (A. G. U. Perera), Quantum Structure Infrared Photodetector (QSIP) 2009 International Conference, Yosemite, California, January 18 – 23, 2009.
- **INVITED KEYNOTE SPEECH**: "Wavelength Tailorable Detectors: Ultraviolet to Far-Infrared", National Workshop on Advanced Optoelectronic Materials and Devices (AOMD-2008), Varanasi, India, December 22 - 24 2008.
- "UV to IR Dual and Triple Band Detectors Operating at or Around Room Temperature", 53rd DAE Solid State Physics Symposium (DAE-SSPS 2008), Mumbai, India, December 16 - 20, 2008. **(INVITED)**
- "Uncooled Infrared Sensors for Imaging", NATO Workshop on Quantum Structures for Non-Cryogenic Infrared Imaging, Las Vegas, Nevada, USA, November 13 - 14, 2008. **(INVITED)**
- "Uncooled Semiconductor Detectors for IR to UV Remote Sensing", SPIE International Symposium on Infrared Spaceborne Remote Sensing and Instrumentation, San Diego, California, USA, August 10 - 14, 2008. **(INVITED)**
- "Room Temperature IR Photon Detectors Based on Quantum Structures", 7th international conference on low dimensional structures and devices (LDSD 2008), Nottingham UK, April 7 - 9 2008. **(INVITED)**
- "Ultraviolet-to-Infrared Dual-Band Detectors Based on Quantum Dot and Heterojunction Structures", A. G. U. Perera, TFPA, Shanghai, China, September 25 - 28 2007. **(INVITED)**
- "Simultaneous UV-IR dual band detector" (A. G. U. Perera, G. Ariyawansa, H. C. Liu et al), AFB Kirtland, NM, May 29 – 31, 2007. **(INVITED)**
- "Quantum Dot structures for multiband and terahertz detection", Joint Fifth International Conference on Solid State Crystal & Eighth Polish Conference on Crystal Growth (ICSSC-5 & PCCG-8), Zakopane, Poland, May 20 - 24, 2007. **(INVITED)**

- "Terahertz Sensors, Plasmon and Nanocluster Enhancements", 6th international conference on low dimensional structures and devices (LDSD 2007), April 15 - 20, 2007, The Caribbean Archipelago of San Andrés, Colombia. **(INVITED)**
- "III-V Based THz Detectors and Plasmon Effects", SPIE International Symposium on Quantum Sensing and nanophotonics Devices: Detectors and emitters, San Jose, California, USA, January 22 - 25, 2007. **(INVITED)**
- "Novel Terahertz Detectors", (A. G. U. Perera) Key Note Talk , Joint 31st International Conference on Infrared and Millimeter Waves and 14th International Conference on terahertz Electronics (IRMMW-THz 2006), Shanghai, China, September 18, 2006. **(INVITED)**
- "Homo and Heterojunction Dual Band Detectors", (A. G. U. Perera) International Conference on Quantum Well Infrared Photodetectors – QWIP 2006, Kandy, Sri Lanka, June 18 - 24, 2006. **(INVITED)**
- "Welcome address and opening remarks, (A. G. U. Perera) International Conference on Quantum Well Infrared Photodetectors – QWIP 2006, Kandy, Sri Lanka, June 18-24, 2006. **(INVITED)**
- "Terahertz Semiconductor Detectors: Designs to Applications", APS March meeting, 2006, Baltimore, MD, March 13 -17. **(INVITED)**
- "Heterojunction detectors for THz applications", SPIE Conference on Sensors and Photonics for Applications in Industry, Life Sciences, and Communications, Boston, Massachusetts, October 23 - 26, 2005. **(INVITED)**
- "Quantum Structures for Multiband Photon Detection", SPIE International congress on Optics and Optoelectronics, Warsaw Univ. of Technology, Warsaw, Poland, August 28 - September 2, 2005. **(INVITED)**
- "AlGaAs emitter based Terahertz Detectors", QWIP 2004, Kananaskis, Alberta, Canada, August 11, 2004. **(INVITED)**
- "Evolution of Quantum Detectors from VLWIR to FIR", SPIE International Symposium on Quantum Sensing: Evolution and Revolution from Past to Future, San Jose, California, USA, January 27 - 30, 2003.
- "Far Infrared Detectors for Space Applications", APS March Meeting, Seattle, WA, March 12 - 16 2001. **(INVITED)**
- "32 micron InGaAs/GaAs QWIP Detector", Nanophotonics-2000, Nizhni Novgorod, Russia, March 20 - 23, 2000. **(INVITED)**
- "Negative Capacitance and Noise Issues in HIWIP Structures", Sixth International Symposium on Long Wavelength Infrared Detectors", Boston, MA, November 1 - 6, 1998. **(INVITED)**
- "Novel far-infrared detectors for space applications", SPIE International Conference on Solid State Crystals '98: Epilayers and Heterostructures in Optoelectronics and Semiconductor Technology, Zakopane, Poland, October 12 - 16, 1998. **(INVITED)**
- "28 Micron Quantum Well IR photodetector", Intersubband Transitions in Quantum Wells: Physics and Applications, Tainan, Taiwan, December 15 - 18, 1997. **(INVITED)**
- "Spontaneous Pulsing and New Modes of Infrared Detection", 187th Electro Chemical Society, 1995, Chicago, IL, October 8 - 13. **(INVITED)**
- "Pulsing Si Neural Nets and Nonlinear Dynamics" IASTED international Conference on Modeling and Simulation, 1995, Colombo, Sri Lanka, July 26 - 28. **(INVITED)**

- "Homojunction Interfacial Workfunction Internal Photoemission (HIWIP) Infrared Detectors", SPIE (40th) international Symposium on Optical Science, Engineering, and Instrumentation, 1995, San Diego, California, July 9 - 14. **(INVITED)**
- "Novel Wavelength Tunable Homojunctions For FIR Detection" SESAPS, 1994, Newport News, VA, November 9 - 11. **(INVITED)**
- "LWIR Emission From Multi Quantum Well Superlattices", NATO Advanced Research Workshop, Whistler, BC, Canada, September 7 - 10, 1993. **(INVITED)**
- "Photon detection in Parallel Asynchronous Processing", SPIE Visual Communications and Image Processing '90: Fifth in a Series, Lausanne, Switzerland, October 01, 1990. **(INVITED)**

INVITED COLLOQUIA PRESENTED

- Photonics (Physics & Optoelectronics) in the Year of Light: From UV to Far Infrared (THz) and Applications, Kennesaw State University, Kennesaw, GA, Feb 24th, 2015.
- "Wavelength Extended Detectors from Infrared to Ultra-Violet", Nanyang Technological University, Singapore, Jan 5th, 2015.
- "Wavelength Extended Multiband Detectors for UV to Far Infrared", Department of Physics, Naval Postgraduate School, Monterey, CA, December 8th, 2014.
- "Wavelength extended Multiband Detectors for UV to Far Infrared", State Key Laboratory for Superlattices and Microstructures Institute of Semiconductors Chinese Academy of Science, Beijing, 100083, China. September 15th, 2014.
- "History of Electronics from Transistors to Infrared detectors", Faculty of Science, University of Kelaniya, Kelaniya, Sri Lanka, October 15th, 2013.
- "Graduate studies in US", Faculty of Science, University of Kelaniya, Kelaniya, Sri Lanka, October 15th, 2013.
- "Nanostructure Multiband Detectors for UV to Far Infrared", NanoSEC Seminar, Department of Physics and Astronomy, University of Georgia, Athens, USA, October 1, 2010.
- "50 Years of Lasers and Optoelectronics Today", Sri Lanka Association for the Advancement of Science (SLAAS), Sri Lanka, June 28, 2010.
- "Electronics and Optoelectronics Today", Institute of Physics, University of Colombo, Sri Lanka, June 25, 2010.
- "Graduate Studies in US: Physics graduate Program at GSU and 3+2 joint (GSU- University of Colombo) Undergraduate Program for Physics Students, College of Science, University of Colombo, Colombo, Sri Lanka. December 15, 2008.
- "Homo and Heterojunction Multi-band (UV-FIR/THz) Photon Detectors", Department of Physics, Auburn University, Auburn, Alabama, USA, October 24, 2008.
- "Near to Far Infrared Sensors and Applications", Sri Lanka Air Force, Ratmalana, Sri Lanka, July 21, 2006.
- "Homo and Heterojunction Multi-band (UV-FIR/THz) Photon Detectors " State University at Buffalo, Buffalo, School of Engineering & Applied Sciences, Department of Electrical and Computer Engineering, New York, USA, April 06, 2006.
- "University Research Commercialization" – biz4sci lunch seminar series, November 9, 2005, GSU,

300 Alumni Hall.

- "New Approaches in FIR detection", SLAAS Section E, Colombo, Sri Lanka, July 5, 2002.
- "Wavelength Tailorable Far Infrared Detectors", Institute for Fundamental Studies, Kandy, Sri Lanka, June 12, 2002.
- "Far Infrared Detectors for Space Applications", Georgia Institute of Technology, Dept. of Electrical Engineering, November 02, 2001.
- "Graduate Studies in a U. S. University, Physics Program at Georgia State University", Institute for Physics of Microstructures, Russian Academy of Sciences, Nizhni Novgorod, Russia, October 23, 2000.
- "Recent Developments in Far Infrared Detectors for Astronomy Applications", Institute for Physics of Microstructures, Russian Academy of Sciences, Nizhni Novgorod, Russia, October 27, 2000.
- "Graduate Studies in the US", University of Peradeniya, SEU Physical Society, Peradeniya, Sri Lanka, July 15, 1999.
- "Graduate Studies in the US", Institute of Fundamental Studies, Kandy, Sri Lanka, July 15, 1999.
- "Recent Developments in Far Infrared Detectors", Institute of Fundamental Studies, Kandy, Sri Lanka, July 14, 1999.
- "Homojunction Interfacial Workfunction Internal Photoemission (HIWIP) Far-Infrared Detectors for Space Applications", National University of Singapore, Department of Electrical Engineering, Microelectronics Division, Singapore, June 14, 1999.
- "Si and GaAs superlattices for far infrared detection", Aizu University, Aizu-Wakamatsu, Japan, September 22, 1998.
- "Novel IR detectors of Semiconductor Superlattices", Communications Research Laboratory, Tokyo, Japan, September 21, 1998.
- "Novel FIR detectors for Space Applications", University of Georgia, Athens, GA, June 12, 1998.
- "Far Infrared Semiconductor Detectors", Marmara University, Istanbul, Turkey, April 24, 1998.
- "Wavelength Tunable FIR detectors", University of Illinois, at Chicago, April 9, 1998.
- "Wavelength Tunable FIR detectors", University of California, Los Angeles, (UCLA) Dept. of Electrical Engineering, March 25, 1998.
- "Far Infrared Detectors for Space Applications", Institut fur Halbbleiterphysik, Johannes kepler Universitat Linz, Austria, August 28, 1997.
- "Far Infrared Detectors for Space Applications", Technische Universitat Wien, Austria, August 27, 1997.
- "Graduate Studies in USA", Post Graduate Institute, University of Peradeniya, Sri Lanka, August 14, 1997.
- "Far Infrared Detectors" Department of Engineering Mathematics, University of Peradeniya, Peradeniya, Sri Lanka, August 14, 1997.
- "Graduate Studies in the United States" at University of Colombo, Sri Lanka, August 11, 1997.
- "Far Infrared Detectors for Astronomical Applications" at the Sri-Lanka Association for the

Advancement of Science, (SLAAS -Section E), Colombo, Sri Lanka, August 06, 1997.

- "Semiconductor Optoelectronic Devices for Neural Net Emulation" at Emory University, Department of Physics, Atlanta, September 29, 1995.
- "Artificial Neurons for Biological Retinal Concepts" at the Sri-Lanka Association for the Advancement of Science, (SLAAS -Section E), Colombo, Sri Lanka, August 17, 1995.
- "Use of Semi-conductors to Emulate Nerve Cell Activity" at the University of Peradeniya, Peradeniya, Sri-Lanka, August 14, 1995.
- "Novel Si HIWIP Detectors for FIR - LWIR", Jet Propulsion Laboratory, California Institute of Technology, March 22, 1995.
- "Novel Infrared Detectors" at the Indiana University of Pennsylvania, Department of Physics, PA, November 15, 1991.
- "Photon Detection with Parallel Asynchronous Processing using Neuronlike Pulsing of p-i-n Structures" at the University of Pittsburgh, Department of Electrical Engineering, PA, October 14, 1991.
- "Artificial Neuron Emulation with Pulsing Si Structures" at the National Research Council, Ottawa, Canada, August 1990.

PUBLICATIONS OF A. G. U. PERERA

PATENTS

1) "ATR - FTIR for Non-Invasive Detections of Colitis", (A. G. U. Perera, J. Titus, D. Merlin, and E. Viennois), Application Number # 62/175,050, application submitted to the US Patent and Trademark Office, June 12, 2015.

2) "Early Detection of Cell Activation by ATR-FTIR Spectroscopy" (A. G. U. Perera, J. Titus, C. Filfili, J. K. Hilliard), Application Number # PCT/US14/068542, submitted to the US Patent and Trademark Office, December 3 2014.

3) "High Operation Temperature Split-Off Band Infrared Detectors", Canada Patent # CA 2662526 A1, issued on 12/22/2015.

4) "Tunable Hot Carrier Photodetector" (A. G. U. Perera and Y. F. Lao), International Publication Number # 2015/069367A2, 14 May, 2015.

5) "High operating temperature split-off band infrared detector with double and/or graded barrier", (A. G. U. Perera and S.G. Matsik) U. S. Patent No.8,530,995, issued on 9/10/2013.

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48. "Heterojunction Detectors for Use in the terahertz Range", (A. G. U. Perera, S. G. Matsik, D. G. Easev, M. B. M. Rinzan, H. C. Liu, Z. R. Wasilewski, and M. Buchanan), Technical Digest, THz 2003, 35, (2003).

47. "Enhanced response in Infrared detectors with doped substrates" (S.G. Matsik, M. B. M. Rinzan, D. G. Easev, A. G. U. Perera, S. Krishna, H. C. Liu), BAPS, 48 (No 9), 17, (2003).

46. "Cutoff Tailoring with Al Fraction in Heterojunction Interfacial Workfunction Internal Photoemission Detectors" (A.G.U. Perera, S.G. Matsik, M.B.M. Rinzan, H.C. Liu), BAPS, 47, 58, (2002).

45. "Experimental and Many-Body Theoretical Investigation of Intersubband Far Infrared Absorption in Quantum Well Photodetectors" (Mark I. Stockman, Sergey V. Faleev, Steven G. Matsik, A. G. Unil Perera, H.C. Liu), BAPS, 47, 59, (2002).

44. "Performance Improvements of Homojunction FIR Detectors" (M. B. M. Rinzan, S.G. Matsik, A. G. U. Perera, H. C. Liu, B. Zvonkov, V. Gavrilenko), BAPS, 47, 58, (2002).

43. "Effects of Doping on the Cutoff Wavelength and Barrier Height in p-type Far Infrared Detectors" (S. G. Matsik, M. B. M. Rinzan, A. G. U Perera, H. C. Liu, B. Zvonkov, V. Gavrilenko, W. J. Schaff) BAPS, 47, 58, (2002).

42. "Far Infrared Semiconductor Detectors for Space Applications", (A. G. U. Perera), BAPS, 46, Pg1194, APS Meeting March 12-16, 2001, **(INVITED)**.

41. "Photocurrent Overshoot in Quantum Well Infrared Photodetectors Under Transient Conditions, Experimental and Simulational Verification", (V. Letov, A. G. U. Perera, M. Ershov, H. C. Liu, M. Buchanan, and Z. R. Wasilewski) BAPS, 46, Pg1195, APS Meeting March 12-16, 2001.

40. "Novel Heterojunction Far Infrared Photodetectors with Cutoff Wavelength at 70 Microns", (A. G. U. Perera, S. G. Matsik, V. Y. Letov, B. Yaldiz, H. C. Liu, A. Shen, M. Gao, Z. R. Wasilewski, M.

Buchanan, and S. Rolfe) PHOTONICSWEST 2001, January 20-26, 2000, San Jose, CA, USA.

39. "Admittance of Multiple Quantum Well, Wire or Dot Structures with Blocking Injection Contact", (M. Ershov, H. Ruda, A. Shik, A. G. U. Perera, B. Yaldiz, S. G. Matsik, H. C. Liu, Z. R. Wasilewski, and M. Buchanan) First Georgia Tech Conference on Nanoscience and Nanotechnology, pg. 72, 2000.

38. "Low Dark Current HIWIP Detectors with Resonance Cavity Effect", (A. G. U. Perera, A. L. Korotkov, and W. Z. Shen) First Georgia Tech Conference on Nanoscience and Nanotechnology, pg. 89, 2000.

37. "Space Charge Spectroscopy of Integrated Quantum Well Infrared Photoedetector-Light Emitting Diode (M. Ershov, A. G. U. Perera, B. Yaldiz, S. G. Matsik, H. C. Liu) Materials Research Society, Nov. 29-Dec 3, 1999, Boston MA.

36. "Low frequency noise and interface states in GaAs homojunction far-infrared detectors" (W. Z. Shen, A. G. U. Perera) BAPS, 44, APS Centennial Meeting, 20-26 March 1999.

35. "Studies of negative capacitance behavior in GaAs homojunction far-infrared detectors" (A. G. U. Perera, W. Z. Shen, H. C. Liu, M. Buchanan and W. Schaff) BAPS, 44, APS Centennial Meeting, 20-26 March 1999.

34. "Slow Transients in GaAs/AlGaAs Quantum Well Infrared Photodetectors", (S. G. Matsik, A. G. U. Perera, Y. W. Yi, M. Ershov, H. C. Liu), BAPS, 44, APS Centennial Meeting, 20-26 March 1999.

33. "Effects of Radiation on GaAs HIWIP FIR Detectors"(B. Yaldiz, Y. Ju, W. Shen, A. G. U. Perera), BAPS, 44, APS Centennial Meeting, 20-26 March 1999.

32. "Noise Properties and Negative Capacitance In GaAs HIWIP FIR Detectors", (A. G. U. Perera, W. Shen, H. C. Liu, M. Buchanan, and W. J. Schaff), ECS 98, November 2-6, 1998, Boston, USA.

31. "High Performance GaAs Homojunction Far-Infrared Detectors", (A. G. U. Perera, W. Shen, H. C. Liu, M. Buchanan and W. J. Schaff), PHOTONICSWEST 98, January 24-30, 1998, San Jose, CA, USA.

30. "Novel Far-Infrared Detectors For Space Applications", (A. G. U. Perera, W. Shen, H. C. Liu, M. Buchanan, and W. J. Schaff), International Conference on Solid State Crystals-Materials Science And Applications, October 12-16, 1998, Zakopane, Poland.

29. "Si Homojunction Internal Photoemission Far-Infrared Detectors", (A. G. U. Perera, W. Shen, H. C. Liu, M. Buchanan, M. O. Tanner and K. L. Wang), SPIEPC7, September, 1998, Beijing, China.

28. "GaAs Homojunction Far-Infrared Detectors For Astronomy Applications", (A. G. U. Perera, W. Shen, M. H. Framcombe, M. Shure, H. C. Liu, M. Buchanan, and W. J. Schaff), SPIE 3354, SPIE's International Symposium on Astronomical Telescopes and Instrumentation, March 20-28, 1998, Kona, Hawaii, USA.

27. "Far Infrared (28 micron Peak) GaAs/AlGaAs Quantum well Photodetectors", (A. G. U. Perera, W. Shen, S. G. Matsik, H. C. Liu, M. Buchanan and W. J. Schaff), ITQW 97, International Conference on Intersubband Transitions in Quantum wells: Physics and Applications, December 15-18, 1997, National Cheng Kung University, Tainan, Taiwan.

26. "Far Infrared Free Hole absorption in Epitaxial Silicon Films for homojunction Detectors", (A. G. U. Perera, W. Shen, M. Tanner and K. L. Wang), The Materials Research Society, Boston, December 1-5, 1997, pg 53.

25. "Barrier Resonances and Capacitance in MQW IR detector Structures", (A. G. U. Perera and S. G. Matsik, V. G. Silvestrov, H. C. Liu, M. Buchanan and W. Wasilewski), The Electrochemical Society

Interface, # 1823, summer 1997, pg PS-95.

24. "Layer Effects on the performance of far Infrared detectors", (A. G. U. Perera and H. X. Yuan, and W. Z. Shen), BAPS, 42, 626, (1997).

23. "Space charge analysis in multi-quantum well structures using C-V measurements.", (A. G. U. Perera and S. G. Matsik, V. G. Silvestrov), BAPS, 41, 739, (1996).

22. "Performance Evaluation of Si n+-i-n+ homojunction far infrared detectors including space charge effect.", (A. G. U. Perera and H. X. Yuan), BAPS, 41, 87, (1996).

21. "Spontaneous Pulsing in Semiconductor Homo- and Heterostructures Designed as IR detectors.", (A. G. U. Perera), The Electrochemical Society Interface, # 204, Fall 1995, pg 121.

20. "Space Charge Effects in Si HIWIP Far-Infrared Detectors.'', (A. G. U. Perera and H. X. Yuan), BAPS, 40, 763, (1995).

19. "Hopf Bifurcations in Si p-i-n diodes.'', (A. G. U. Perera and S. Betarbet), BAPS, 39, 476, (1994).

18. "Comparison of a fly visual neural network with a Si p-i-n diode transient sensing network.'', (S. R. Betarbet and A. G. U. Perera), BAPS, 39, 600, (1994).

17. "A photoresponse mechanism for homojunction FIR detectors.'', (H. X. Yuan and A. G. U. Perera), BAPS, 39, 600, (1994).

16. "Spontaneous Pulsing in Multiquantum Well Structures.'', (S. G. Matsik and A. G. U. Perera), BAPS, 39, 857, (1994).

15. "Space charge Generation and Recombination Effects in Multiquantum Well Structures.'', (S. G. Matsik and A. G. U. Perera), BAPS, 39, 1810, (1994).

14. "Dark Current mechanisms in Si homojunction internal photoemission (HIP) far-infrared (FIR) detectors.'', (H. X. Yuan and A. G. U. Perera), BAPS, 39, 1811, (1994).

13. "Classification and Analysis of Homojunction Infrared Detection.", (A. G. U. Perera, H. X. Yuan and M. H. Francombe), The Electrochemical Society Interface Fall 1994, pg 123, and Extended Abstracts 186th society meeting, Volume 94-2, pp 398-399, ISBN 1-56677-0831.

12. "Hardware implementation of small neural networks with Si p-i-n structures.'', (S. Betarbet and A. G. U. Perera), BAPS, 38, 578, (1993).

11. "Homojunction Multilayers for Far Infrared Detection.", (A. G. U. Perera, M. H. Francombe, X. –M. Feng and J. –W. Choe), The Electrochemical Society Interface Fall 1993, pg 110.

10. "Visible and IR Transient Sensing in a Parallel Asynchronous Processor'', (S. Betarbet, A. G. U. Perera and M. H. Francombe), BAPS, 37, 219, (1992).

9. "Extrinsic Silicon for Wavelength Tunable FIR Detection'', (A. G. U. Perera, R. E. Sherriff, R. P. Devaty, and M. H. Francombe), BAPS, 37, 580, (1992).

8. "A Theoretical Model for Bimodal Pulsing in Liquid Helium Cooled p-i-n Diodes'', (S. Matsik and A. G. U. Perera), BAPS, 37, 735, (1992).

7. "Optimization of Superlattice Cascade Process for IR Emission Using Complex Energy Method'', (J. W. Choe, A. G. U. Perera, K. M. S. V. Bandara, Y. Kuang, and M. H. Francombe), BAPS, 37, 790, (1992).

6. "IR Detection at Wavelengths up to 200 microns in Extrinsic Semiconductor Devices" (A. G. U. Perera, R. E. Sherriff, R. P. Devaty and M. H. Francombe) SPIE, 16th International Conference on

Infrared and Millimeter waves, Aug 26-30,1991, Lausanne-Switzerland.

5. "An Unconventional High Performance Infrared Detector'', (A. G. U. Perera and D. D. Coon), BAPS, 34, 835 (1989).

4. "Action Potentials in Silicon Devices at Low Temperatures", (A. G. U. Perera and D. D. Coon), BAPS, 33, 421 (1988).

3. "Integrate-and-Fire Dynamics and Spiketrain Information Coding in Neuron Equivalent Circuits Employing Silicon Diodes'', (A. G. U. Perera and D. D. Coon) Neural Networks 1 – Supplement 1, 379 (1988).

2. "High Dynamic Range Infrared Detectors", (A. G. U. Perera and D. D. Coon), Conf. Digest, 13th Int. Conf. on Infrared and Millimeter waves, SPIE Vol. 1039, 209 (1988).

1. "Far Infrared Detection Without Preamplifiers", (A. G. U. Perera and D. D. Coon), Conf. Digest, 12th Int. Conf. on Infrared and Millimeter Waves, IEEE catalog number 87CH2490-1, 235 (1987).

Poster Presentations

- **"Graded Barrier for Photovoltaic Operation of *p*-type GaAs/AlGaAs Heterostructure",** P. K. D. D. P. Pitigala, S. G. Matsik, A. G. U Perera, S. P. Khanna, L. H. Li, E. H. Linfield, Z. R. Wasilewski, M. Buchanan, and H. C. Liu, American Physical Society (APS) April Meeting 2012, Session E1.00092, Atlanta March 31 – April 3, 2012. (Presented by P. K. D. D. P. Pitigala)
- **"Optimization of TiO_2/SiO_2 Nanorod Multilayers for High Angle of Incidence Anti-Reflection Coatings for Solar Cells",** R. Jayasinghe, A. G. U. Perera, Y. Zhao, American Physical Society (APS) April Meeting 2012, Session E1.00093, Atlanta March 31 – April 3, 2012. (Presented by R. Jayasinghe)
- **"Visible to near infrared absorption in natural dye (Mondo Grass Berry) for Dye Sensitized Solar Cell"**, P. K. D. D. P. Pitigala, L. A. A. De Silva, A. G. U. Perera, American Physical Society (APS) April Meeting 2012, Session E1.00094, Atlanta March 31 – April 3, 2012. (Presented by P. K. D. D. P. Pitigala)
- **"Early Detection of Anti-CD-3 Mediated Jurkat Cell Activation by ATR-FTIR Spectroscopy"**, J. Titus, C. Filfili, J. Hilliard, and A. G. U. Perera, First Center for Diagnostics and Therapeutics Conference, Georgia State University, March 17, 2012. (Presented by J. Titus)
- **"Brain Temperature Dynamics During Functional Activity"**, G. Rothmeier, A. G. U. Perera, and M. Dhamala, Society for Neuroscience, Washington, D.C., November 16, 2011. (Presented by G. Rothmeier)
- **"Brain Temperature Dynamics During Functional Activity"**, G. Rothmeier, A. G. U. Perera, and M. Dhamala, Neuroscience Institute Open House, Georgia State University, August 18, 2011. (Presented by G. Rothmeier)
- **"Early Detection of CD_3 – Mediated T Cell Activation by ATR-FTIR Spectroscopy"**, J. Titus, C. Filfili, J. Hilliard, and A. G. U. Perera, Seventh Annual Molecular Basis of Disease (MBD) Research Day, Georgia State University, June 17, 2010. (Presented by J. Titus) **(Won the best poster award)**

- **"Investigation of the Detection and Identification of Herpes Simplex Virus I by FTIR Spectroscopy"**, J. Titus, C. Filfili, J. Hilliard, and A. G. U. Perera, Sixth Annual Molecular Basis of Disease (MBD) Research Day, Georgia State University, May 21, 2010. (Presented by J. Titus) **(Won the best poster award)**

- **"Simultaneous Detection of Ultraviolet and Infrared Radiation from a Single Detector",** S. G. Matsik, R. C. Jayasinghe, G. Ariyawansa, and A. G. U. Perera, NanoTechnology for Defense Conference 2010, Atlanta, Georgia, May 3 - 6, 2010. (Presented by A. G. U. Perera)

- **"Quantum dot sensitized solar cells based on nanostructured zinc oxide"**, (P. K. D. D. P. Pitigala, K. Tennakone, and A. G. U. Perera), SPIE (Defense, Security, and Sensing) 2010, **7683-45**, Orlando, Florida, April 05 - 09, 2010. (Presented by A. G. U. Perera)

- **"Room Temperature Terahertz Emitters for Various Applications"**, (L. E. Byrum, A. Weerasekara, A. G. U. Perera, S. G. Matsik, M. Buchanan and H. C. Liu), The 10th International Conference on Intersubband transitions in Quantum Wells (ITQW) 2009, Montreal, Canada, September 6 – 11 , 2009.

SCIENTIFIC REVIEWS

Program Reviews

External

- Member: External Advisory Board of Partnership for Research and Education in Materials (PREM) Program, Thomas W. Cole Jr Center for Research in Science and Technology, Clark Atlanta University, Georgia Technical Institute, and Morehouse College (2011- 2015), first review meeting: April 4, 2011 and second review meeting: May 29, 2012.

Internal

- Member of the GSU, P&A committee for National Research Council (NRC) Study of Research Doctorate Program Review, 2006.
- Member Department of Physics & Astronomy, Self Study Committee for the Academic Program Review - 2007, member of the 5 year Action Plan committee for P&A (2009).

EXTERNAL THESIS REVIEWS

- External Ph.D. thesis review of Ms. Kanika Bansal, Department of Physics, Indian Institute of Science Education and Research (IISER), Pune, India, 2014.
- External Ph.D. thesis review of Mr. Saumya Sengupta, Indian Institute of Technology, Department of Electrical Engineering, Bombay, India, 2014.
- External MS thesis review of Mr. Johan Venter, M.Eng (Microelectronic Engineering) Faculty of Engineering, University of Pretoria, Republic of South Africa, 2012.
- External reviewer for Nanyang Technological University, Singapore, Electrical Engineering Department, 1999-2009.

REVIEW PANELS – EXTERNAL

- IEEE Electron Devices Society Fellow evaluation committee, 2014

- IEEE Senior Member upgrade review panel, February 13, 2010.
- Panel Member: "NSF – Solar Organics Microdetectors", evaluated about 25 proposals, held June 3-4, 2008, Arlington, VA.
- Panel Member: Nanoscale Exploratory Research Teams (NER) for the Active Nanostructures and Nanosystems (ANN) solicitation, Evaluated 40 proposals from various Universities, NSF, February 22-23, 2007
- Panel Member : Sensor and Sensor Network SST Panel, within the ECS division, NSF, evaluated 26 proposals from various universities, May 19-20, 2005
- Panel Member : SBIR/STTR Phase I, Terahertz Detectors Panel, NSF, evaluated 7 proposals from various small business and University partnerships, September 7, 2004
- Panel Member: Electronics, Photonics and Device Technologies Program (EPDT) within the ECS Division, Evaluated 20 proposals from various Universities, NSF, June 9-10, 2003
- Panel Member: "NSF – Nanoscale Science and Engineering (Interdisciplinary Research Teams) Panel", evaluated 12 proposals from various Electrical Engineering Departments, January 22-23, 2001.
- Panel Member: "U. S. Department of Education, "Fund for the Improvement of Post Secondary Education (FIPSE)", May 31-June 2, 2000, Atlanta, GA.
- Panel Member: "NSF – Physical Foundations for Enabling Technologies, Elect, Photonics & Device Technology", evaluated 12 proposals from various Electrical Engineering Departments, January 26-28, 2000.
- Panel Member: "NSF – Physical Foundations for Enabling Technologies, Elect, Photonics & Device Technology", evaluated 16 proposals from various Electrical Engineering Departments, Arlington, VA, January 11-12, 1999.
- Panel Member: "NSF – Small Business Innovation Research grants", evaluated 10 proposals from Small Business Scientific Research Companies, Arlington, VA, April 8-9, 1997.
- Panel Member: "NASA – Space Ultraviolet/visible Detector Development Program", evaluated 16 proposals from various Companies, and Universities, Arlington, VA, April 28-29, 1996.
- Panel Member: "NSF – Research Initiation Awards", evaluated 15 proposals from various Electrical Engineering Departments, Arlington, VA, April27, 1994.
- Panel Member: "NSF – Research Equipment grants", evaluated 16 proposals from various Electrical Engineering Departments, Arlington, VA, April28, 1994

INDIVIDUAL PROPOSALS REVIEWED –EXTERNAL

- More than 1000 proposals have been reviewed (in addition to Panel reviews) between 1993 and Jan 25, 2017 from agencies such as the NSF, NASA, CRDF, U. S. Army, Kentucky Science & Engineering Foundation, Research Corporation, and University of Pittsburgh.

PROPOSAL REVIEW PANELS – INTERNAL

- Panel Member: Next Generation Proposal Review panel, Evaluated proposals for faculty hires, Georgia Stet University, (Jan 18, 2017).

- Panel Member: Next Generation Proposal Review panel, Evaluated proposals for faculty hires, Georgia Stet University, (Jan 16, 2016).
- Panel Member: "Internal Grants Program Review Panel, evaluated proposals of Quality Improvement Fund, Research program enhancement, Research initialization grants and research team grants for Georgia State University, (March 11 and 25, 2002).
- Panel Member: "Internal Grants Program Review Panel, evaluated proposals of Quality Improvement Fund, Research program enhancement, Research initialization grants and research team grants for Georgia State University, (April 9, 16 and 23, 2001).
- Panel Member: "Research Initiation Grant Review Committee/Panel- Georgia State University". Evaluating 12 proposals from Georgia State University for office of Research and sponsored programs, (March 2000).
- Panel Member: "Research Initiation Grant Review Committee/Panel- Georgia State University". Evaluating 16 proposals from Georgia State University for office of Research and sponsored programs, (March 1999).

PAPERS REVIEWED

- Reviewer for various journals including, Applied Physics Letters, Optical Engineering, Optics Express, Journal of Applied Physics, IASTED, Solid State Electronics, Infrared Physics & Technology, J. Vac Science & Technology, Europhysics letters, Thin Solid Films, IEEE Transactions on Nanotechnology, Photonics Tech. Letters, IEEE Transactions on Electron Devices, International. J. of Quantum Electronics, and Materials Chemistry and Physics. On average 10 papers per year.

BOOKS REVIEWED

- "Quantum Dot Infrared Photodetectors" (Semiconductor Semimetal Series) by Ajit V. Barve, Sanjay Krishna, Editors: C. Jagadish and S. D. Gunapala, Elsevier Limited, December 15, 2010.
- "InAs/(In)GaSb Type II Strain Layer Superlattice Detectors" (Elena Plis, Jean Baptiste Rodriguez, and Sanjay Krishna) in "Comprehensive Semiconductor Science and Technology", Edited by Pallab Bhattacharya, reviewed for Elsevier Ltd., 2009.
- "The Physical Universe, eighth edition, by Konrad B. Krauskopf and Arthur Beiser", reviewed for Mc-Graw Hill publishers, December 1997, June 1998.
- "The Physics of Solids", J. B. Ketterson, reviewed for Prentice Hall, March 2003.

PARTICIPATION IN UNIVERSITY/COLLEGE/DEPARTMENTAL COMMITTEES

- Member of the Board of Directors: Georgia State University Research Foundation, 2015-16, 2016-17.
- Chair of the Budget Committee of the University Senate, - 2016-2017
- Member of the Research committee of the University Senate, - 2012-
- Chair – Natural and Computational Science Area Committee On Promotion and Tenure, College of Arts and Sciences , 2014 -
- Member (CAS Representative); University Promotion and Tenure Manual Review

Committee, 2014 -

- Member of the Search Committee Nuclear Physics , 2014- 2015
- Area Member of the Regents' Professorship Evaluation panel (2014)
- Member – Natural and Computational Science Area Committee On Promotion and Tenure, College of Arts and Sciences , 2008 - 2013
- Member of the University Senate, 2012- 2013 , 2013-2014, 2014 - 2015
- Chair of the Condensed Matter Search Committee, P&A 2013- 2014
- Member of the "Exceptional Service Faculty Award" Selection Committee, GSU - 2013
- Member of the Search Committee Condensed Matter Physics , 2011- 2012
- Member of the Search Committee Physics Education Research , 2011- 2012
- Member of the committee for review and recommendations for the title of "Distinguished University Professor" (2013).
- External assessor for Full Professor Promotion for Nanyang Technological University (NTU) of Singapore in the School of Electrical and Electronic Engineering, February 2012.
- External reviewer for Chair Promotion for University of Leeds School of Electronic and Electrical Engineering, April 2011.
- Search Committee Member: Dean of College of Arts and Sciences (2010 -2011)
- Member: Center for Diagnostics and Therapeutics, College of Arts and Sciences (2010 -2011)
- Faculty Search Committee Member: Second Century Initiative (2CI) faculty cluster hire for the Center for Diagnostics and Therapeutics (2010 -2011)
- Advanced Physics Camp (For High Achieving High School Students) Chair, 2009-2010.
- College Promotions and Tenure (Area) Committee - (2008-2011, 2011- 2014)
- Physics & Astronomy Executive Committees - (97-98, 98-99, 99-00, 00-01, 01-02, 02-03, 03-04, 04-05, 05-06, 06-07, 07-08, 08-09, 09-10, 10-11, 11-12)
- Institute of Neuroscience Executive Committee – (2008-2009, 2009-2010)
- Chair- Physics search committee for B&B Neuroscience faculty search committee (2007-08)
- B&B Neuroscience faculty search committee member- (06-07, 07-08)
- B&B Scientific Committee - (04-05, 05-06, 06-07)
- B&B Fellows Committee – Chair – (04-05), member – (05-06, 06-07)
- Departmental Promotions and Tenure Committees (01-02, 02-03, 03-04, 04-05, 05-06, 06-07, 07-08)
- Arts & Science Petitions Committee- Chair, (02-03)
- Task Force on Preparing Graduate Students to Teach, (02-03,04-05)
- Enrollment Management & Strategic Planning Committee, (01-02)
- Petitions Committee of the Graduate Council, CAS (95-96, 96-97, 98-99, 00-01, 01-02)
- 3 year Evaluation of the Department chair- March 2000 - (Committee chair), 2003 (Member), 2007

(Committee Chair)

- Graduate Council of the College of Arts and Sciences (95-96, 96-97, 98-99, 99-00, 00-01, 01-02, 05-06)
- Departmental Condensed Matter (Experimental) Faculty Search Committee (Chair, 97-98, 05-06, 06-07)
- Cumulative 3 year pre-tenure review committees -Served in 2 in 97-98, one as the chair, served in one in 1999-2000, served as the chair for one in 02-03 and one in 03-04.
- Departmental Nuclear Physics Faculty Search Committee (97-98, 07-08)
- Departmental Visiting Lecturer Search Committee (2008-2009, 2009-2010, 2011-2012)
- Departmental Condensed Matter -(Theory) Faculty Search Committee (97-98, 02-03, 03-04, 05-06, 11-12)
- Departmental Semester Conversion Committee -(responsible for Physics Graduate programs) (96-98)
- Departmental Bio-Physics Faculty Search Committee (96-97)
- Departmental Research Committee (92-93,93-94,94-95,95-96,96-97,97-98,99-00,00-01, 01-02, 02-03, 03-04)
- Departmental Condensed Matter Faculty Search Committee (95-96)
- Departmental Graduate Admissions Committee (93-94, 94-95)
- Departmental Solid-State Faculty Search Committee (94-95)
- Departmental Astronomy (Interferometry / Instrumentation) Faculty Search Committee (94-95)

DIRECTION OF INDIVIDUAL STUDENT WORK

Ph.D. STUDENTS (COMPLETED)

- Jitto Titus, Ph.D. completed in fall 2016, Research Advisor
- P. K.D. Duleepa Pitigala, Ph.D. completed in October 2013, Research Advisor
- Ranga Jayasinghe, Ph.D. completed in August 2012, Research Advisor
- Viraj Jayaweera, completed in December 2008, Research Advisor [Student received the Outstanding Advanced Student Award (07-08) in Physics.]
- Gamini Ariyawansa, Ph.D. completed in August 2007, Research Advisor [Student received the Outstanding Advanced Student Award (05-06) in Physics and also a joint winner of the dissertation Grant award (06-07) from GSU, also the runner up for Suttles award. One of the six finalists at the IEEE Sensors 2007, Best student presentation.]
- A. B. Weerasekara, Ph.D. completed in August 2007, Research Advisor [Student received the Outstanding Advanced Student Award (06-07) in Physics and also a joint winner of the Dissertation Grant award (06-07) from GSU.]

- Mohamad B. Rinzan, Ph.D. completed in August 2006, Research Advisor [Student received the Outstanding 2nd Year Student (01-02), Outstanding Teaching Assistant (03-04) and Outstanding Advanced Student (03-04) Awards in Physics.]

- Steven G. Matsik, Ph.D. completed in June 1998, Research Advisor [Student received the Outstanding Advanced Graduate Student Award (96-97) in Physics.]

- Sandeep Betarbet, Ph.D. completed in December 1993, Research Advisor

Ph.D. STUDENTS (PRESENT)

- Seyoum Wolde, 6th year graduate student, research advisor

- Dilip Chauhan, 5th year graduate student, research advisor

- Hemendra Mani Ghimire, 2nd year graduate student, research advisor

- Sameera Kelum Perera, 1st year graduate student, research advisor

M.S. STUDENTS (COMPLETED)

- Dimuthu Obeysekara, (non thesis MS), completed July 201, research advisor
- Ismet Gelen, (non thesis MS), completed May 2015, research advisor
- Justin McLaughlin, Thesis Completed May 2014 , research advisor
- Greggory Rothmeier, Thesis Completed May 2012, research advisor
- Laura Byrum, Thesis Completed August 2009, research advisor
- Mustafa Alevli, Thesis Completed December 2003, research advisor
- Slava Letov (non thesis MS), completed August 2001, research advisor
- Yaldiz Bilal (non thesis MS) , completed August 2001, research advisor
- Yong Ju (non thesis MS) , completed August 2001, research advisor
- Sisira Gamage, Thesis Defense completed on 23rd June 1997, research advisor
- Jiyong Choi, Thesis Defense completed on 12th July 1996, research advisor
- Yongwoo Yi, Thesis Defense completed on 19th July 1996, research advisor
- Victor O'Brien, Thesis Defense completed on 1st March 1995, research advisor

UNDERGRADUATE RESEARCH STUDENTS

- Undergraduate Research : Christopher Thurman Mann, 2016
- Undergraduate research: Jacob Andrew Mann, 2015
- Undergraduate research: Jason Mueller, 2015
- Undergraduate research: Tresor Gutondela, 2012
- Independent study: Torrey Harris, 2010
- Independent study: Rajitha Siyasena, 2010
- Independent study: Sharani Jayaratne, 2010
- Independent study: Greggory Rothmeier, 2008 -2009
- Undergraduate research: Semiconductor Device Characterization, Chu Xia, 2008
- Undergraduate research: Non-thesis research paper: Laura Byrum, "UV-IR dual Band detector capacitance measurements", 2007
- Undergraduate research: Non-thesis research paper: Markus Stevens, "UV-IR dual Band detector response variations with UV exposure", 2006
- Independent study: Raymond Yuan, August 2005 - Research experience for undergraduates
- Independent study: Jericho Cain, November 2004 - Research experience for undergraduates
- Independent study: Michael Herrara, May 2003 – Aug 2004 Research experience for undergraduates
- Independent study: Aparana Reddy, February 2003 – August 2003 Research Experience for undergraduates (REU) project
- Independent Study:Nadiya Zelikosvaya, 2002, Research Experience for Undergraduates (REU) project
- Research Study: Kawamura Hikaru, Summer 2001, Undergraduate Research project (1 credit)
- Independent Study: Faranda Jonathan , 2001-02, Research Experience for Undergraduate (REU)
- Independent Study: Michelle Alston, 1999-00, 00-01, Research Experience for Undergraduates (REU) project
- Independent Study: Shehana Hameed, 1998-99, Research Experience for Undergraduates (REU) project

- Independent Study: Lauren Pierce, 1998-99, REU project
- Independent Study: Aric Walker, McNair Scholar, 1997 summer
- Independent Study: Dicko Hammadun, 1997-98, Research Experience for Undergraduates (REU) project
- Independent Study: Buddhi Godawatte, 1996-97, REU project
- Independent Study: Jim Mcvea, 1996-97 Summer REU project
- Independent Study: Mark Mandt, 1993-95, REU project
- Independent Study: Princess Simpson, McNair Scholar, 1993-95, REU project
- Independent Study: James Kinney, 1994-95, Senior Research project
- Independent Study: Thea Penas, 1993-94, REU project

K-12 SUMMER PROGRAMS

(HIGH SCHOOL PHYSICS TEACHER ENHANCEMENT)

- Dr. Tengiz Shonia, High School Physics Teacher, Campbell High School, Smyrna, Georgia (Summer 2009- IB program)
- Anthony Osinski, High School Physics Teacher, Campbell High School, Smyrna, Georgia (Summer 2008- IB program)
- Anthony Osinski, High School Physics Teacher, Campbell High School, Smyrna, Georgia (Summer 2007- IB program)
- Amy Stone & Gwen Ross, Advanced Science Teachers, Griffin Middle School, Smyrna, Georgia (Summer 2004- RET program)
- Bobby D. Sutton, B. E. Usher Middle School, Atlanta, Georgia (Summer 1994- CEISMC program)

(HIGH SCHOOL GIFTED STUDENT PERFORMANCE ENHANCEMENT)

- Noreen Khan, Student (Summer Research), Pope High School Marietta GA, Summer 2009.
- "Advanced Physics Camp" program for rising High School IB students, June 22-26, 2009.
- "Fun Physics Days" program for rising Campbell High School IB students, July 23-25, 2008.
- Quest Mentoring Program, Ryan Schwanke: Internee, Gwinnett County Public Schools Program for high school students in the gifted program, 1996.
- Summer 93 NSF-NIH Young Scholar Program. (Sharon Goh, and Crystal Stanley, High School Scholars).

Ph.D. THESIS DEFENSE COMMITTEE MEMBERSHIPS (COMPLETED)

- Bidhan Lamichhane (Phys. & Ast., Georgia State University), Spring 2015
- Prabha Padukka (Phys. & Ast., Georgia State University), Fall 2014
- Nan Zhao (Phys. & Ast., Georgia State University) Summer 2014
- Mathes Dayananda (Phys. & Ast., Georgia State University) - 2013
- Ramzan Atalay (Phys. & Ast., Georgia State University) Fall 2012
- Yamina Touhami (Phys. & Ast., Georgia State University) Spring 2012
- Aruna Ramanayaka (Phys. & Ast., Georgia State University) 2011
- Hari Lamichchane (Phys. & Ast., Georgia State University) Fall 2011
- Jing Guo (Phys. & Ast., Georgia State University) Spring 2011
- Ayao Mamert Sossah (Phys. & Ast., Georgia State University) Fall 2010
- Goksel Durkaya, (Phys. & Ast., Georgia State University) Fall 2009
- Anastasia Rusina (Phys. & Ast., Georgia State University) Fall 2009
- Maxim Durach, (Phys. & Ast., Georgia State University) Fall 2009
- Sreeja Parameswaran , (Phys. & Ast., Georgia State University) Summer 2009
- Deepak Ragahavn, (Phys. & Ast., Georgia State University) Summer 2009
- Robert A. Zaballa, (Phys. & Ast., Georgia State University) Fall 2008
- Prabath Hewageegana, (Phys. & Ast., Georgia State University) Fall 2008
- Pushpa Wijesinghe , (Phys. & Ast., Georgia State University) Spring 2007
- Sanjeewa Witharana, (Phys & Astr, Georgia State University) Spring 2007
- Nayana Jayatilake, (Phys & Astr, Georgia State University) Spring 2006
- Jayantha Seneviratne, (Phys & Astr, Georgia State University) Aug 2006
- Sibel Tokedemir, (Phys & Astr, Georgia State University) Oct 2004
- Kang Jung-seng , (Phys. & Ast., Georgia State University) Dec 2001
- Sergey Faleev, (Phys. & Ast., Georgia State University) Aug 2001
- Donggyue Cho, (Phys. & Ast., Georgia State University) Feb 1998

- Victor Bellito, (Phys. & Ast., Georgia State University) Nov 1999
- Don Barry, (Phys. & Ast., Georgia State University) Dec 1995
- Dae-Soung Kim, (Phys. & Ast., Georgia State University) July 1995
- Ziyang Zhang, (Phys. & Ast., Georgia State University) May 1995
- Arshad Ali, (Electrical Engineering, U. Pittsburgh) Dec 1992
- Hafeez ur Rahman, (Electrical Engineering, U. Pittsburgh) Dec 1992

M. S. DISSERTATION DEFENSE COMMITTEES (COMPLETED)

- Sampath Gamage, (Phys. & Ast., Georgia State University), 2014
- Wang Zhuo (Phys. & Ast., Georgia State University), 2014
- Thakshila Herath (Phys. & Ast., Georgia State University), 2014
- Indika Kankanamge (Phys. & Ast., Georgia State University) , 2014
- Venkata Chaganti (Phys. & Ast., Georgia State University) , 2013
- Bidhan Lamichhane (Phys. & Ast., Georgia State University), 2012
- Prabha Padukka (Phys. & Ast., Georgia State University), 2012
- Jielei Wang (Phys. & Ast., Georgia State University), 2010
- Nan Zhao (Phys. & Ast., Georgia State University), 2009
- Jing Guo (Phys. & Ast., Georgia State University), 2009
- Mathes Dayananda (Phys. & Ast., Georgia State University, 2009
- Anastasia Rusina (Phys. & Ast., Georgia State University), 2008
- Maxim Durach, (Phys. & Ast., Georgia State University), 2008
- Sreeja Parameswaran (Phys. & Ast., Georgia State University), 2007
- Priyangika Jayaweera (Phys. & Ast., Georgia State University), 2007
- Yiying Zhou, (Phys. & Ast., Georgia State University), 2006
- Deepak Raghavan, (Phys & Ast, Georgia State University), 2006
- Robert Zaballa, (Phys & Ast, Georgia State University), 2006
- Prabath Hewagegana, (Phys & Ast, Georgia State University), 2006

- Ayao Marmet Sossaha (Phys & Ast, Georgia State University), 2002
- Su Yan (Phys. & Ast., Georgia State University), 1999
- Mevlut Bulut (Phys. & Ast., Georgia State University), 1999
- Qin Wang (Phys. & Ast., Georgia State University), 1999
- Y. Choi-Kang (Phys. & Ast., Georgia State University), 1999

MEMBERSHIP ON RESEARCH COMMITTEES FOR INDIVIDUAL STUDENT WORK (PRESENT)

- Wang Zhuo (Phys. & Ast., Georgia State University) – 4th Year Student
- Thakshila Herath (Phys. & Ast., Georgia State University) – 4th Year Student
- Sampath Gamage (Phys. & Ast., Georgia State University) – 4th Year Student
- Kasuni Nanyakkara (Phys. & Ast., Georgia State University) – 4th Year Student
- Liu Han Chan (Phys. & Ast., Georgia State University) – 4th Year Student
- Ganesh Chand (Phys. & Ast., Georgia State University) – 4th Year Student
- Indika Kankanamge (Phys. & Ast., Georgia State University) – 6th Year Student
- Venkata Chaganti (Phys. & Ast., Georgia State University) – 5th Year Student
- TianYu Ye (Phys. & Ast., Georgia State University) – 5th Year Student

COURSES TAUGHT

- Physics 8910: Graduate Directed Studies (Every Semester)
- Physics 8710: Graduate Research Topics (Every Semester)
- ASTR 4010 - Astronomy Techniques, a one week module on IR detectors and detection Techniques, (Fall 04, Fall 06)
- Physics 3902 - Modern Physics Laboratory, a two week module on semiconductor device characterization, taught every Spring since 2000
- Physics 4700/7700: Electricity & Magnetism (SP02)
- Physics 1111: Introductory Physics (Non Calculus) Mechanics, Heat (SP01,SP04,SP05)
- Physics 8500: Advanced Topics in Physics (Graduate Course)
- Physics 8510: Introductory Solid State Physics (Graduate Course) (SP00,SP03,F05,F07,F09, F11)
- Physics 6910/4910: Solid State Physics (SP99)

- Physics 4600/7600: Classical Mechanics (Every Spring)
- Physics 6300: Teaching Physics (Every Fall)
- Physics 101: Introductory Physics (Non Calculus): Mechanics (F92,W93,F93,W94,F94,F96)
- Physics 102: Introductory Physics (Non Calculus): Electricity and Magnetism (W95, F97)
- Physics 238: Introductory Physics (Calculus Based): Electricity and Magnetism (SP94,W96,S96)
- Physics 239: Introductory Physics (Calculus Based): Heat, Sound, Light and Modern Physics (SP97)
- Physics 491: Independent study, Introduction to semiconductors (James Kinney; F94)
- Physics 392: Modern Physics Laboratory II (2 weeks out of total 8 weeks) (SP96), (SP97), (SP 98)
- Physics 495: Senior Research, Current-voltage non-linearities in GaAs/AlGaAs multi quantum well structures (James Kinney; W95, S95)
- Physics 4950: Senior Research, Capacitance-voltage characteristics in GaAs/AlGaAs HEIWIP detector structures (Michael Herrara; Summer 04)
- Physics 851: Introductory Solid State Physics (Graduate Course) (S93, S95, W97)
- Physics 8910: Graduate Directed Studies: Semiconductor IR detectors (Bilal Yaldiz; F98,SP99)
- Physics 8910: Graduate Directed Studies: Semiconductor IR detectors (Yong Ju; F98, SP99)
- Physics 891: Graduate Directed Studies: Fourier Transformations, Fourier Transform IR spectrometry, Semiconductor IR detectors (Youlin Lou; W93, S93, S93)
- Physics 871: Graduate Research Topics: Space Charge Effects in Si pin diodes, Space charge generation and recombination in GaAs/AlGaAs MQWs, Spontaneous Pulsing in MQWs (Steve Matsik; S94, F94, S95,F96)
- Physics 891: Graduate Directed Studies: S-type nonlinear current-voltage relationships in GaAs/AlGaAs MQWs, (Steve Matsik; S95)
- Physics 871: Graduate Research Topics: Fourier Transform IR spectrometry, (Sisira Gamage; W96,S96)Physics 891: Graduate Directed Studies: Homojunction IR Detectors, (Sisira Gamage; S96,S97)
- Physics 871: Graduate Research Topics: Transient Current-Voltage measurements in MQW structures, (Youngwoo Ye; W96,S96)Physics 871: Graduate Research Topics: Interpulse time interval analysis, (Jeong Choe; W96, S96)

Murad Sarsour

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Georgia State University
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email: msar@gsu.edu
URL: http://physics.gsu.edu/Sarsour/

Education

Ph.D. in Physics, 2002, University of Houston, Houston, TX, U.S.A.
B.S. in Physics, 1996, Applied Science University, Jordan

Academic Appointments

- Associate Professor, 2014 - present, Dept. of Physics & Astronomy, Georgia State University (GSU), Atlanta, GA 30302
- Assistant Professor, 2008 – 2014, Dept. of Physics & Astronomy, Georgia State University (GSU), Atlanta, GA 30302
- Visiting Assistant Professor, Fall 2007, Dept. of Physics, Texas A&M University, College Station, TX 77843
- Postdoctoral Research Associate, August 2005 - July 2008, Cyclotron Institute, Texas A&M University, College Station, TX 77843
- Postdoctoral Research Associate, August 2002 - July 2005, Indiana University Cyclotron Facility, Indiana University, Bloomington, IN 47408

Research Focus

- Heavy Ion Collisions
- Nucleon Spin Structure
- Neutron Weak Interactions
- Neutron Interactions beyond the Standard Model

Grant Support:

Internal

- Two years' start-up funds (travel and summer salary) including one graduate student support.
- GSU Research Initiation Grant, 2010-2011, **$10,000**.

External

- *Research in Heavy Ion Nuclear Reactions*
  Murad Sarsour (co-PI)
  DOE award no. DE-FG02-98ER41068, **$680,000.00**, April 1, 2016 - March 31, 2019
- *RICH Detector for the EIC's Forward Region Particle Identification*
  Murad Sarsour (co-PI)
  Brookhaven National Laboratory, $**131,750.00**, Dec. 17, 2014 - Sep. 30, 2017
- *Neutron Spin Rotation Measurements*
  Murad Sarsour (PI)
  DOE award no. DE-SC0010443, $**220,000.00**, August 15, 2013 - August 14, 2017
- *Measurement of Low Mass Vector Mesons Production and Possible Modification in Heavy Ion Collisions at Forward Rapidity*
  Murad Sarsour (PI)
  DOE award no. DE-SC0013598, $**26,000.00**, May 1, 2015 - April 30, 2017

Mentoring & Advising:

- Dalton Cody Hunley, 2016 – present, Graduate Student / Ph.D., Dept. of Physics & Astronomy, GSU
- Churamani Paudel, 2013 - 2016, Graduate Student / non-thesis master's, Dept. of Physics & Astronomy, GSU - graduated Fall 2016
- Hari Guragain, 2010 - 2015, Graduate Student / Ph.D., Dept. of Physics & Astronomy, GSU– graduated Fall 2015
- Christopher Gastaldo, Spring & Summer 2012, Undergraduate Student, Dept. of Physics & Astronomy, GSU (graduation project)
- Hatun Cacan, 2010 - 2011, Graduate Student / non-thesis master's, Dept. of Physics & Astronomy, GSU (graduation project) – graduated Summer 2011
- Aaron Kelley, 2010 - 2011, Graduate Student / non-thesis master's, Dept. of Physics & Astronomy, GSU (graduation project) – graduated Summer 2011

Masters and PhD Committees:

- Master's in Physics: Cheuk-Ping Wong, November 28, 2016.
- Master's in Physics: Churamani Paudel, September 8, 2016.
- Master's in Physics: Tristan Haseler, July 19, 2016.
- Ph.D. in Physics: Xiaohang Zhang, June 22, 2016.
- Ph.D. in Physics: Margert Jezghani, Nov. 20, 2015.
- Ph.D. in Physics: Hari Guragain, Oct. 20, 2015.
- Ph.D. in Physics: Mohammad H. Javani, Nov. 18, 2014.
- Master's in Physics: Xiaohang Zhang, July 16, 2014.
- Ph.D. in Physics: Nan Zhao, July 11, 2014.
- Master's in Physics: Hari Guragain, April 3, 2014
- Master's in Physics: Margert Jezghani, March 6, 2014

- Ph.D. in Physics: Mathes Dayananda, Nov. 19, 2013.
- Ph.D. in Physics: Laura Patel, April 2, 2013.
- Ph.D. in Physics: Ramazan Atalay, Nov. 29, 2012.
- Ph.D. in Physics: Abhisek Sen, Nov. 6, 2012.
- Ph.D. in Physics: Aruna Ramanayaka, July 10, 2012.
- Master's in Physics: Mohammad Javani, Feb. 7, 2012.
- Master's in Physics: Aaron Kelley, August 4, 2011.
- Master's in Physics: Hatun Cacan, July 13, 2011.
- Ph.D. in Astronomy, Steven Williams, June 27, 2011.
- Master's in Physics: Abhisek Sen, April 27, 2010.
- Master's in Physics: Christopher Oakley, July 20, 2009.
- Master's in Physics: Mathes Kanishka Dayananda, April 28, 2009.
- Ph.D. in Physics: Robert Zaballa, November 11, 2008.

Other significant scholarly/research activities:

- Cohosted the sPHENIX collaboration meeting at GSU in December 15 - 17, 2016.
- Member of Radiation Protection Committee at GSU, 2014 - present.
- Member of Physics & Astronomy curriculum committee at GSU, 2014 - present.
- Member of Physics & Astronomy library committee at GSU, 2013 - present.
- Member of Physics & Astronomy publicity committee at GSU, 2013 - present.
- Member of the sPHENIX collaboration, 2015 - present.
- Member of the Fifth Force (F5) collaboration, 2013 - present.
- Member of the PHENIX collaboration, 2008 - present.
- Member of the Neutron Spin Rotation (NSR) collaboration, 2003 - present.
- Cohosted the sPHENIX Hadronic Calorimeter Workshop in December 15 - 16, 2015. This workshop focuses on the sPHENIX hadronic calorimeter R&D.
- Member of pre-tenure review committee of Dr**.** Ruili Wang of the Physics & Astronomy at GSU, 2015.
- Cohosted the sPHENIX Hadronic Calorimeter Workshop in December 15 - 17, 2014. This workshop focuses on the sPHENIX hadronic calorimeter R&D.
- Cohosted the PHENIX FVTX Software Workshop from September 23 to 25, 2013. This workshop focuses on the software development that will enable determining particle collision vertices using a Silicon-Strip Vertex Detector of the PHENIX Experiment at the Relativistic Heavy Ion Collider at Brookhaven National Laboratory.
- Member of RHIC Users Executive Committee, *provide an organized channel for the interchange of information between the Laboratory administration and those who use BNL's nuclear, high-energy, and heavy-ion facilities*, member 06/2012 – 05/2014
- Member of algebra based introductory physics curriculum committee at GSU, 2011 - 2013.
- Member of PHENIX IRC100 paper review committee, 2013
- Chair of PHENIX IRC142 paper review committee, 2012
- Production deputy manager of the data collected during run 2010 for the PHENIX collaboration

- Member of PHENIX IRC107 paper review committee, 2010
- Helped organize the pentathlon event at the Science Olympics, February 2010.
- Chaired the "Intermediate and High Energy Nuclear Physics" session at the SESAPS 2009, November 2009.
- Local organizational committee member of the PHENIX Collaboration Meeting, March 2009.
- Attended the 13th Workshop for New Physics and Astronomy Faculty, at the American Center for Physics in College Park, MD 20740-3841, June 26-29, 2009.
- Helped organized the pentathlon event at the Science Olympics, February 2009.

Courses Taught/ Developed:

- Taught/teaching: Phys 3850/7850 (Spring 2015 and 2017): Statistical & Thermal Physics
- Designed and taught/teaching: Phys 4410/6410 (Spring 2010, 2011, 2013, 2015 and 2017): Introduction to Nuclear and Particle Physics
- Taught: Phys 1111k (Fall 2008, 2009 (two), 2010, 2011 (two), 2012, and 2014; Summer 2011; Spring 2012)
- Taught: Phys 1112k (Spring 2009, 2011, 2014 and 2016; Fall 2012, 2013 (two), 2014 and 2016; and Summer 2012 and 2014)
- Taught: Phys 2211k (Summer 2011 and 2012, Spring 2012)

Presentations:

- *"Parity-Violating Neutron Spin Rotation in n-^{4}He"*,
  Oral session at the APS Division of Nuclear Physics Meeting 2016; Vancouver, BC, Canada, October 13-16, 2016.
- *"Phi Meson Production at Forward Rapidity with the PHENIX Detector at RHIC"*, Invited talk at the 5th International Conference on New Frontiers in Physics (ICNFP 2016); Kolymbari, Crete, Greece, July 6-14, 2016.
- *"Cold nuclear matter effects on low mass vector mesons and heavy flavor production in d+Au collisions at $\sqrt{s_{NN}}$ = 200 GeV"*, Invited talk at the Hard Probes 2015; Montreal, Quebec, Canada, June 29th, 2015 to July 3rd, 2015.
- *"Neutron Spin Rotation Measurements"*, Oral session at the APS April Meeting 2015; Baltimore, MD, April 11-14, 2015.
- "*Low Mass Vector Meson Production in d+Au collisions at $\sqrt{s_{NN}}$ = 200 GeV with the PHENIX Detector at RHIC*", Contributed poster at the XXIV Quark Matter; Darmstadt Germany, May 19 - May 24, 2014
- *"Double Longitudinal Spin Asymmetry Measurements of Inclusive pi and eta Production at PHENIX in 200 GeV Polarized p+p Collisions"*, Invited talk at the XXI International Workshop on Deep-Inelastic Scattering and Related Subjects; Marseille, France, April 22-26, 2013.
- *"Observation of forward rapidity W-decay in 500 GeV p+p collisions"*, Oral session at the APS April Meeting 2012; Atlanta, GA, March 31 - April 3, 2012.

- "*Overview of the PHENIX transverse and longitudinal spin physics program*", Invited talk at the International Workshop on Diffraction in High-Energy Physics; Otranto (Lecce), Italy, September 10 - 15, 2010.
- "*Performance of PHENIX Resistive Plate Chambers*", Oral session at the APS April Meeting 2010; Washington, DC, February 13-16, 2010.
- *"Constraints on ΔG through Longitudinal Double Spin Asymmetry Measurements of Inclusive Jet Production in Polarized p+p Collisions at 200 GeV"*, Oral session at the 18th International Symposium on Spin Physics, Charlottesville, VA, October 10, 2008.
- *"Longitudinal Double Spin Asymmetry for Inclusive Jet Production in Polarized p+p Collisions at √200 GeV"*, Seminar at Brookhaven National Laboratory, Upton, NY, July 22, 2008.
- *"Constraints on Gluon Polarization in the Proton from STAR data"*, Colloquium at Georgia State University, Atlanta, GA, February 28, 2008.
- *"Constraints on Gluon Polarization in the Proton from STAR Data"*, Colloquium at Texas A&M University Cyclotron Institute, College Station, TX, February 22, 2008.
- *"Constraints on ΔG through Longitudinal Double Spin Asymmetry Measurements of Inclusive Jet Production in Polarized p+p Collisions at 200 GeV*", Oral session at the Fall 2007 DNP meeting of the American Physical Society, Newport News, VA, October 2007.
- *"Recent Results from STAR Longitudinal Spin Program at RHIC"*, 2007 RHIC & AGS Annual Users' Meeting, Brookhaven National Laboratory, NY, June 18-22, 2007.
- *"Longitudinal Double-Spin Asymmetry for Inclusive Jet Production in Polarized p+p Collisions at √s = 200 GeV"*, Oral session at the Fall 2006 DNP meeting of the American Physical Society, Nashville, TN, October 2006.
- *"Recent Results from STAR Spin Program at RHIC",* APS Topical Group on Hadronic Physics, Nashville, TN, October 22-24, 2006.
- *"Measurement of the Absolute Differential Cross Section of np Elastic Scattering near 200 MeV"*, Texas A&M University/ Cyclotron Institute, TX, May, 2005.10.
- *"Measurement of the Absolute Differential Cross Section of np Elastic Scattering near 200 MeV"*, IUCF, IN, March, 2005.
- *"Measurement of the Absolute Differential Cross Section of np Elastic Scattering Near 200 MeV"*, Oral session at the Fall 2004 DNP meeting of the American Physical Society, Chicago, IL, October 2004.
- *"Measurement of the Absolute Differential Cross Section of np Elastic Scattering near 200 MeV"*, NIST, MD, Sept. 2003.
- *"Measurement of the Absolute Differential Cross Section of np Elastic Scattering Near 200 MeV"*, Oral session at the 17th International IUPAP Conference on Few-Body Problems in Physics, Durham, NC, June 2003.
- *"High Resolution Spectroscopy of ${}^{12}_{\Lambda}B$ Hypernuclei by the (e,e'K$^+$) Reaction"*, IUCF, Indiana University, Bloomington, IN, May 2002.
- *"High Resolution Spectroscopy of ${}^{12}_{\Lambda}B$ Hypernuclei by the (e,e'K$^+$) Reaction"*, Argonne National Lab, Chicago, IL, April 2002.
- *"The performance of the HNSS Silicon Strip Detector"*, Oral session at the Fall 2000 DNP meeting of the American Physical Society, Williamsburg, VA, October 2000.

Publications (in refereed journals)**:**

1. A. Adare *et al.* (**M. Sarsour**), Phys. Rev. D **94**, 112008 (2016).
2. A. Adare *et al.* (**M. Sarsour**), Phys. Rev. C **94**, 064901 (2016).
3. A. Adare *et al.* (**M. Sarsour**), Phys. Rev. C **94**, 054910 (2016).
4. A. Adare *et al.* (**M. Sarsour**), Phys. Rev. Lett. **116**, 122301 (2016).
5. A. Adare *et al.* (**M. Sarsour**), ®Phys. Rev. D **93**, 051103 (2016).
6. A. Adare *et al.* (**M. Sarsour**), Phys. Rev. C **93**, 034904 (2016).
7. A. Adare *et al.* (**M. Sarsour**), Phys. Rev. C **93**, 034903 (2016).
8. A. Adare *et al.* (**M. Sarsour**), Phys. Rev. C **93**, 024911 (2016).
9. A. Adare *et al.* (**M. Sarsour**), Phys. Rev. C **93**, 024904 (2016).
10. A. Adare *et al.* (**M. Sarsour**), Phys. Rev. C **93**, 024901 (2016).
11. A. Adare *et al.* (**M. Sarsour**), ®Phys. Rev. C **93**, 011901 (2016).
12. A. Adare *et al.* (**M. Sarsour**), Phys. Rev. C **93**, 014904 (2016).
13. A. Adare *et al.* (**M. Sarsour**), ®Phys. Rev. D **93**, 011501 (2016).
14. A. Adare *et al.* (**M. Sarsour**), Phys. Rev. C **92**, 044909 (2015).
15. A. Adare *et al.* (**M. Sarsour**), Phys. Rev. Lett. **115**, 142301 (2015).
16. A. Adare *et al.* (**M. Sarsour**), Phys. Rev. C **92**, 034914 (2015).
17. A. Adare *et al.* (**M. Sarsour**), Phys. Rev. C **91**, 064904 (2015).
18. A. Adare *et al.* (**M. Sarsour**), Phys. Rev. Lett. **114**, 192301 (2015).
19. W. M. Snow, E. Anderson, L. Barrón-Palos, C. D. Bass, T. D. Bass, B. E. Crawford, C. Crawford, J. M. Dawkins, D. Esposito, J. Fry, H. Gardiner, K. Gan, C. Haddock, B. R. Heckel, A. T. Holley, J. C. Horton, C. Huffer, J. Lieffers, D. Luo, M. Maldonado-Velázquez, D. M. Markoff, A. M. Micherdzinska, H. P. Mumm, J. S. Nico, **M. Sarsour**, S. Santra, E. I. Sharapov, H. E. Swanson, S. B. Walbridge and V. Zhumabekova, Rev. Sci. Instrum. **86**, 055101 (2015).
20. A. Adare *et al.* (**M. Sarsour**), Phys. Rev. C **91**, 044907 (2015).
21. A. Adare *et al.* (**M. Sarsour**), ®Phys. Rev. C **91**, 031901 (2015).
22. A. Adare *et al.* (**M. Sarsour**), Phys. Rev. C **91**, 024913 (2015).
23. A. Adare *et al.* (**M. Sarsour**), Phys. Rev. D **91**, 032001 (2015).
24. A. Adare *et al.* (**M. Sarsour**), Phys. Rev. C **90**, 064908 (2014).
25. A. Adare *et al.* (**M. Sarsour**), Phys. Rev. C **90**, 054905 (2014).
26. A. Adare *et al.* (**M. Sarsour**), Phys. Rev. D **90**, 078008 (2014).
27. A. Adare *et al.* (**M. Sarsour**), Phys. Rev. D **90**, 052002 (2014).
28. A. Adare *et al.* (**M. Sarsour**), Phys. Rev. D **90**, 012007 (2014).
29. A. Adare *et al.* (**M. Sarsour**), Phys. Rev. Lett. **112**, 252301 (2014).
30. S. S. Adler *et al.* (**M. Sarsour**), Phys. Rev. C **89**, 044905 (2014).
31. A. Adare *et al.* (**M. Sarsour**), Phys. Rev. Lett. **111**, 032301 (2013).
32. A. Adare *et al.* (**M. Sarsour**), Phys. Rev. C **87**, 044909 (2013).
33. A. Adare *et al.* (**M. Sarsour**), Phys. Rev. D **87**, 012011 (2013).
34. A. Adare *et al.* (**M. Sarsour**), Phys. Rev. C **86**, 064901 (2012).
35. A. Adare *et al.* (**M. Sarsour**), Phys. Rev. Lett. **109**, 152301 (2012).
36. L. Adamczyk *et al.* (**M. Sarsour**), Phys. Rev. D **86**, 032006 (2012).

37. J. S. Nico, C. D. Bass, T. D. Bass, B. E. Crawford, K. Gan, B. R. Heckel, D. Luo, D. M. Markoff, A. M. Micherdzinska, H. P. Mumm, A. K. Opper, **M. Sarsour**, E.I. Sharapov, W. M. Snow, H. E. Swanson, S. B. Walbridge, and V. Zhumabekova, NIST SP **1127**, 46 (2011).
38. A. Adare *et al.* (**M. Sarsour**), Phys. Rev. Lett. **106**, 062001 (2011).
39. W. M. Snow, C. D. Bass, T. D. Bass, B. E. Crawford, K. Gan, B. R. Heckel, D. Luo, D. M. Markoff, A. M. Micherdzinska, H. P. Mumm, J. S. Nico, A. K. Opper, **M. Sarsour**, E. I. Sharapov, H. E. Swanson, S. B. Walbridge, and V. Zhumabekova, ®Phys. Rev. C **83**, 022501 (2011).
40. B. I. Abelev *et al.* (**M. Sarsour**), Phys. Rev. C **82**, 034909 (2010).
41. B. I. Abelev *et al.* (**M. Sarsour**), Phys. Lett. B **683**, 123 (2010).
42. B. I. Abelev *et al.* (**M. Sarsour**), Nucl. Phys. A **832**, 134 (2010).
43. B. I. Abelev *et al.* (**M. Sarsour**), Phys. Rev. C **80**, 064912 (2009).
44. B. I. Abelev *et al.* (**M. Sarsour**), ®Phys. Rev. C **80**, 041902 (2009).
45. B. I. Abelev *et al.* (**M. Sarsour**), Phys. Rev. C **80**, 044905 (2009).
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SPIE – The International Society for Optical Engineering, Fellow

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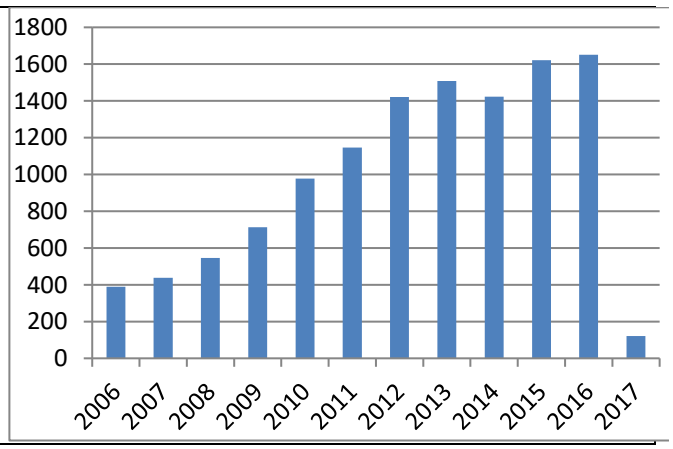

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1. Personal

- Born: Kharkov (Ukraine, former USSR)
- US citizen
- Phone (Worldwide): +1-678-457-4739

2. Brief Narrative

Mark I. Stockman, Ph. D., D. Sc., is a Professor of Physics, Distinguished University Professor, and Director of Center for Nano-Optics (CeNO) at Georgia State University at Atlanta, GA.

Personal: Born in Kharkov (Ukraine), US citizen. MS (Honors) in Theoretical Physics from Novosibirsk State University (Russia), 1970. Diploma in Physics (with Honors) and MS in Physics from Novosibirsk State University, Russia, 1970. Ph. D. in Theoretical Physics from Institute of Nuclear Physics (Novosibirsk), Russian Academy of Sciences, 1975. D.Sc. in Theoretical and Optical Physics from Institute of Automation and Electrometry (Novosibirsk), Russian Academy of Sciences, 1989. Recent research focuses on electronic and optical properties of plasmonic metal and metal-semiconductor nanostructures. Published over 190 major research articles. **American Physical Society (APS), Fellow; Optical Society of America (OSA), Fellow; SPIE – The International Society for Optical Engineering (Fellow).**

Invited/Keynote Talks and Lectures: Presented numerous plenary, keynote and invited talks and lectures at major Conferences in the field of optics and nanoplasmonics. Chairman of SPIE *Metal Nanoplasmonics* Conference 2005-2012 at San Diego (CA), co-Chair of OSA Nanoplasmonics and Metamaterials Conference (META) 2008 and 2010. Presented invited lecturers at various international scientific schools, including *International Winter College on Nanophotonics* (2005 and 2012) at the Abdus Salam International Center for Theoretical Physics at Trieste, Italy, *Erasmus Mundus School*, Porquerolles Islands (France, 2008), International Summer School *New Frontiers in Optical Technologies*, Tampere University of Technology (2008 and 2009, Tampere, Finland), APS March Meeting 2009, Korean Nanooptics Society Winter Workshop (2007-2010), Instrument Technology Research Center (ITRC), Hsinchu, Taiwan (2009), IEEE International Conference COMCAS 2009, Tel Aviv, Israel (2009), International Summer School *Dissipation at Surfaces*, University of Duisburg-Essen, Germany (2009), the International Conference on Micro/Nano Optical Engineering (ICOME) at Changchun, China (2011), Zhong-Guan-Cun Forum on Condensed Matter Physics – the 232th Lecture at Beijing Institute of Physics, Chinese Academy of Sciences, Beijing, 2011. He also presented numerous invited talks at major international conferences; the most recent of them were talks at the 2015 NanoMeta Conference at Seefeld (Austria).

Taught short courses *Nanoplasmonics* at 2005-2012 SPIE *Photonics West* Meetings and 2005-2012 SPIE *Optics and Photonics* Meetings, ETOPIM International Conference at Sidney (Australia); Ecole Normale Supérieure de Cachan (France) (2006); University of Stuttgart (2008), Max Planck Institute for Quantum Optics (Garching at Munich, Germany, 2009), Enrico Fermi School at Varenna (Italy) 2010, Ettore Majorana International School at Erice, Sicily 2008, 2011, 2013, 2015, Abdus Salam International Center for Theoretical Physics (ITCP) (Trieste, Italy), 2005 and 2012.

Visiting Positions: Distinguished Visiting Professor at Ecole Normale Supérieure de Cachan (France) (March, 2006 and July, 2008); Invited Professor at Ecole Supérieure de Physique et de Chimie Industrielle, Paris, France, May-June, 2008; Guest Professor at the University of Stuttgart (September-November, 2008); a Visiting Professor for Senior International Scientists of the Chinese Academy of Sciences at Changchun Institute of Optics, Fine Mechanics, and Physics, 2012t; Guest Professor at Ludwig Maximilian University (Munich, Germany) and Max Plank Institute for Quantum Optics (Garching at Munich, Germany) at the Munich Advanced Photonics (MAP) Center of Excellence, and Center for Advanced Studies at Ludwig Maximilian University (Munich, Germany), 2008-2009, and 2013; a Visiting Professor for Senior International Scientists of the Chinese Academy of Sciences at Changchun Institute of Optics, Fine Mechanics, and Physics (2012); an Academic Icon Professor at University of Malaysia, Kuala Lumpur (2014-2015).

Expertise: Nanoplasmonics and nanooptics, physical optics, theoretical condensed matter and optical physics, and strong-field and ultrafast optics and nanoplasmonics.

Major Scientific Results:

Mark I. Stockman is a pioneer of nanoplasmonics publishing his first results in this area in 1988, setting the foundations of the field and later having obtained groundbreaking results in it. His pioneering research in this area began with the introduction of the giant optical enhancement in fractal nanoclusters of plasmonic

metals. He was one of the co-authors in a fundamental paper (1992) that correctly predicted the spectrum of surface enhanced Raman scattering (SERS) with a dramatic enhancement in the red/near-ir spectral region, which was instrumental in the discovery by K. Kneipp et al. (1999) of the single-molecule SERS, as acknowledged by the corresponding reference. Today SERS is a thriving field with many new phenomena and applications.

In 1995-1996 he introduced localization of plasmonic eigenmodes and such universally accepted phenomenon as *plasmonic near-field hot spots*. This direction of research was further developed when in 2001 he in collaboration with David Bergman showed that dark and bright plasmonic eigenmodes co-exist. He also showed that strongly-localized eigenmodes are necessarily dark. Thus it was established that the Anderson localization of surface plasmons does not play a role in far-field optics of nanoplasmonic systems but is very important and can be observed with near-field excitation, which is another fundamental result. These results constitute the fundamental basis of the contemporary nanoplasmonics.

Starting from 2000, Mark Stockman published a series of pioneering results that, to a significant degree, determined the modern development of the field of nanooptics and nanoplasmonics. In 2000 he pioneered the field of ultrafast nanoplasmonics with his Phys. Rev. Lett. article predicting giant ultrafast fluctuations (the "*Ninth Wave Effect"*) of nanoplasmonic local fields. In 2003 he with co-authors introduced *coherent control of ultrafast localization on nanoscale*, another milestone of the ultrafast nanoplasmonics. This development allowed for a very accurate control of optical energy with a nanometer resolution in space and with a femtosecond precision in time. This breakthrough work has initiated a significant field of scientific research; in particular it has stimulated Focus Program *"Ultrafast Nanooptics"* of German Science Foundation (2009).

In 2003, Mark Stockman in collaboration with David Bergman set foundation of quantum nanoplasmonics with a seminal article introducing the spaser [D. J. Bergman and M. I. Stockman, *Surface Plasmon Amplification by Stimulated Emission of Radiation: Quantum Generation of Coherent Surface Plasmons in Nanosystems*, Phys. Rev. Lett. **90**, 027402-1-4 (2003)]. Simultaneously, they filed a patent application for spaser; a *US patent No. 7,569,188* for spaser was issued in 2009. The spaser is a nanoscale quantum generator of local plasmonic fields, which are intense and ultrafast. The spaser is also a quantum amplifier: it is about the same size and with similar gain as the most common and most important microelectronic active element, MOSFET (metal-oxide-semiconductor field effect transistor). Importantly, the spaser is approximately 1000 times faster than the MOSFET The spaser is the previously "missing" active element of nanoplasmonics that possesses a potential to become the basis of active nanoplasmonic technologies. It will be possible to build ultrafast processors of information with spasers replacing MOSFETs. The spasers can also be used in nanosensing, nanoimaging, and nanolithography, and many other fields. Since initial introduction of spaser, Stockman was followed by many research groups from all over the world in developing the spaser both theoretically and experimentally. Recently there has been experimental confirmation and observation of spaser jointly by three groups published in *Nature.* An extensive wave of publications on the spaser and related nanolasers has followed. The spaser will potentially have a revolutionary effect on nanoplasmonics and generally on nanotechnologies. Also, reports and comments on the spaser and nanolasers have been published in Nature, Optics Express, et al. citing spaser as an original idea.

In 2004, Mark Stockman published two seminal results introducing *adiabatic concentration of optical energy on nanoscale* in plasmonic tapers and efficient *nanolenses of nanoparticle aggregates*. Both these works enjoyed wide experimental and theoretical following, accumulating hundreds references.

He is continuing to work very actively. In 2007, he pioneered attosecond nanoplasmonics and *attosecond nanoplasmonic-field microscopy* [in collaboration with a team from Max Plank Institute for Quantum Optics (MPQ, Garching, Germany) and Ludwig Maximilian University (LMU, Munich, Germany)]. Among recent novel results are plasmonic renormalization of Coulomb interactions (2008), time-reversal coherent control on the nanoscale (2008), nanoconcentration of terahertz radiation (2008), Giant Plasmon-Induced Drag Effect Rectification (SPIDER) (2009), spaser as a bistable (logical) nanoamplifier (2010), and coherent control of third harmonic generation in photonic-plasmonic systems [in collaboration with University of Stuttgart, Germany (2010)].

In 2010 he with his collaborators introduced a novel concept of adiabatic metallization of dielectrics in strong fields. In 2011, this concept was developed by him and collaborators to predict the dynamic ultrafast metallization of dielectrics. This development of the ultrafast/ultrastrong-field condensed-matter optical physics is promising to become a foundation of the new solid state technology of information processing that is three orders of magnitude faster than the existing technologies. In 2012, he predicted optical field effect in dielectrics where a strong optical field excites electrical currents with a ~1 fs rise and decay times. This effect was discovered experimentally at MPQ/LMU and published in Nature,

2013, and Nature Photonics, 2014. Another breakthrough was the discovery of efficient generation of hot electrons in adiabatic plasmonic compression and its application to chemical nano-vision, published in 2013 in Nature Nanotechnology. Theory of generation of high harmonics in solids by strong optical fields was recently developed (Phys. Rev. Lett., 2014). Recently a multitude of electronic, optical, and plasmonic phenomena in graphene and other novel two-dimensional materials in superstrong and ultrafast optical fields was predicted and published, 2014-2015.

3. Education

- D. Sci. in Physics, Institute of Automation and Electrometry, Russian Academy of Sciences, Novosibirsk, Russia, 1979-1989. (This degree is much higher than the Ph.D. It typically requires 15 to 20 years of successful research and publication of at least 50 papers in refereed journals. It is awarded to less than 1% of active Ph.D. scientists. A counterpart in Germany is Habilitation)
- Ph.D. in Physics, Institute of Nuclear Physics, Russian Academy of Sciences, Novosibirsk, Russia, 1971-1974. Graduate adviser: Prof. S. T. Belyaev, member of the Russian Academy of Sciences. (Belyaev's major accomplishments: Belyaev's technique for interacting Bose systems; theory of nucleon superconductivity and collective excitations in nuclei.)
- Diploma in Physics and MS in Theoretical Physics (with Honors), University of Novosibirsk, Novosibirsk, Russia, 1970

4. Research and Academic Positions

- GSU Center for Nano-Optics (CeNO), Director, 2014-Present
- Professor of Physics, Department of Physics and Astronomy, Georgia State University, 1996-Present.
- Academic Icon for High Impact Research Professor, University of Malaya, Kuala Lumpur, 2014-2015.
- Guest Professor at Ludwig Maximilian University (LMU) (Munich, Germany) and Max Plank Institute for Quantum Optics (MPQ) (Garching, Germany), 2013-2014
- Visiting Professor for Senior International Scientists of the Chinese Academy of Sciences at Changchun Institute for Optics, Fine Mechanics and Physics, 2012-2013.
- Guest Professor at Max Plank Institute for Quantum Optics (MPQ) (Garching, Germany), Ludwig Maximilian University (LMU) (Munich, Germany) at the Munich Advanced Photonics (MAP) Center and Center for Advanced Studies (CAS) at LMU, December 2008 – August 2009.
- Guest Professor of Physics, University of Stuttgart, Germany, September-November 2008.
- Distinguished Invited Professor of Physics, l'Ecole Normale Supérieure de Cachan (France), July 2008
- Invited Professor, l'Ecole Supérieure de Physique et de Chimie Industrielles de la ville de Paris (France), June 2008.
- Max Planck Award Recipient, Max Plank Institute for Quantum Optics, Garching at Munich (Germany), January-February 2007.
- Invited Professor of Physics, Ecole Normale Supérieure de Cachan (France), January 2006
- Visiting Professor of Physics, Washington State University, 1991-1996
- Visiting Scientist, State University of New York at Buffalo, 1990-91
- Senior Research Scientist, Institute of Automation and Electrical Measurements, Russian Academy of Sciences, 1980-89

- Research Scientist, Institute of Automation, Russian Academy of Sciences, 1975-80
- Research Scientist, Institute of Nuclear Physics, Russian Academy of Sciences, Novosibirsk, Russia, 1974-75
- Instructor (part-time), University of Novosibirsk, 1970-75
- Research Associate, Institute of Nuclear Physics, Russian Academy of Sciences, Novosibirsk, Russia, 1970-74.

5. Research

Theoretical Nanoplasmonics and Nanooptics

The study includes theory of nanoplasmonics, electronic, optical (especially, nonlinear optical and ultrafast optical) properties of nanostructured and nanoscale systems. The study invokes advanced analytical methods and large-scale computer modeling.

This research is supported by grants from the US Department of Energy, US National Science Foundation, US-Israel Binational Science Foundation. The total of MIS's extramural funding is in millions of the USD (see GRANTS AND CONTRACTS Section for details). MIS's research group includes Postdoctoral Associates and graduate students.

5.1. Major Results

- Prediction [103] and invention [60] of *Surface Plasmon Amplification by Stimulated Emission of Radiation (SPASER)*. Spaser is similar to laser, but does not emit light. Instead, it generates local optical fields of high intensity and temporal coherence. Spaser will provide unprecedented capabilities for sensing, probing, manipulation, and modification of nano-objects. The SPASER is both the nanoscopic quantum generator and quantum amplifier of localized optical fields on the nanoscale. As such the SPASER is the "missing" active element of nanoplasmonics. It can amplify similar to a common MOS transistor, but is ~1000 times faster. The SPASER has recently been observed experimentally and is currently a subject of active research efforts of many groups worldwide.
- Theory of ultrafast phenomena in solids in superintense laser fields [26,30,31,33,33,36,40,41]. This predicts semi-metallization effect of crystalline dielectrics (such as quartz and sapphire) and wide-band semiconductors. These are reversible attosecond-timescale phenomena in strong laser fields.
- Prediction of *Metallization of Dielectric Nanofilms by Strong Fields* in adiabatic [54] and ultrafast [42] processes.
- Theory for investigations of bulk dielectrics in strong and ultrafast optical fields: field-effect currents [26] and attosecond control of electronic properties [41]. Theory of high harmonic generation (HHG) in solids by superintense ultrashort optical pulses [24].
- Introduction of an effect of *Adiabatic Energy Nanoconcentration of Optical Energy* [88]: high-efficiency transfer of energy from the far zone to near-zone in tapered nanoplasmonic waveguides. This effect is highly promising for nanooptics and nanotechnology, in particular, for ultramicroscopy and nanomodification. It has been confirmed in numerous experiments and set a foundation of new spectroscopic and nanoscopic techniques.
- Introduction of *Efficient Nanolens* [97] of nanospheres and prediction of a giant SERS from it as a substrate. This prediction has been confirmed experimentally.

- Introduction and study of the surface plasmon localization (bright and dark modes) [107]; introduction of the nanoplasmonic *hot spots* [126, 128, 130].
- Prediction of *Surface Plasmon Induced Drag Effect* (SPIDER) [59], which is generation of very intense terahertz nanoscale fields in nanowire plasmonic waveguides.
- Introduction of attosecond nanoplasmonics [73]. The proposed attosecond plasmonic field microscope allows one directly and non-invasively to measure nanometer-femtosecond spatio-temporal dynamics of local plasmonic fields in metal nanostructures.
- Prediction [105], theory, and numerical simulation [93] of ultrafast nanoscale energy concentration by means of coherent control. This idea provides unique possibilities for controlling energy of ultrafast optical excitation of nanosystems on nanometer-femtosecond spatio-temporal scale. There has recently been the direct experimental observations of the coherent control on the nanoscale.
- Prediction, theory, and numerical simulation of enhanced optical nonlinearities and surface-enhanced Raman scattering by fractal clusters and nanocomposites [143, 144, 150, 154-165]. Many of these predictions have been experimentally confirmed. These effects are due to giant fluctuations and enhancement of local fields in nanosystems predicted in Ref. [130].

5.2. Other Significant Recent Results

- From the fundamental principle of causality, it is rigorously shown that the negative refraction in a uniform and isotropic medium is impossible without significant optical losses in the region of the negative refraction [76].
- Proposal of the full spatio-temporal coherent control on the nanoscale [74] in plasmon polaritonic systems. This allows one to dynamically focus the optical energy in nanoscopic spatial region and femtosecond tine intervals simultaneously. In systems with localized surface plasmons, a possibility is shown to localize optical excitation energy at a given nanoscale site at a required moment of time with femtosecond accuracy using the principles of the time-reversal [70].
- Theory of the ultimate resolution of the “Perfect Lens” in the near field as determined by the spatial dispersion and Landau damping in the electron liquid [42].
- Explanation, theory, and numerical simulation of high-power femtosecond laser damage of dielectrics as “Forest Fires” [91].
- Prediction and numerical simulation of giant random enhancement of femtosecond and attosecond local fields in disordered media (clusters, composites and rough surfaces) under ultrafast excitation (“The Ninth Wave” effect) [113].
- Microscopic theory of radiative and radiationless decay of a quantum dot at a metal surface is developed based on random phase approximation for electron gas in metal [91]. Giant enhancement of relaxation is predicted. (Collaboration with Los Alamos National Laboratory.)
- Theory and interpretation of experimental results on phase-sensitive near-field scanning optical microscopy (NSOM) of metal nanoparticles is developed [91, 100]. (Collaboration with Los Alamos National Laboratory.)
- Theory, numerical simulation, and interpretation of experimental data on enhanced second harmonic generation (SHG) on nanostructured gold surfaces is developed [91]. It is shown that for such systems SHG is highly depolarized and dephased,

providing a perspective nanosource of high-intensity illumination on the nanoscale. (Collaboration with École Normale Supérieure de Cachan, Paris, France.)

- Microscopic many-body theory of a 2d electron gas with Coulomb interaction in semiconductor quantum structures is developed. The theory is based on Kadanoff-Baym-Keldysh field-theoretical technique and uses self-consistent random-phase approximation (SCRPA, also called the GW approximation) [104, 108, 111].
- Microscopic theory of the light-induced (LID) effect based on non-equilibrium quantum field theory (Kadanoff-Baym-Keldysh technique) [116]. New properties of the LID effect are found that are due to energy dependence of electron scattering.
- Dipolar spectral theory of linear and nonlinear optical susceptibilities of nanocomposites has been developed [114]. These composites are predicted to possess greatly enhanced optical nonlinearities.
- Chaotic behavior of quantum currents in a magnetic field has been shown numerically [117]. These currents bear important information on long-range spatial correlation in quantum-chaotic states.
- Predictions, theory, and computer simulation of inhomogeneous localization and chaos of elementary excitations (surface plasmons) in nanostructured systems [120, 121, 124, 126]. A remarkable property of this chaos is the existence of long-range spatial correlations.

5.3. Research Group and Supervision of Students

Graduate Students Sponsored: S. Yu. Novozhilov and A. L. Kozionov (Senior Research Scientists at Institute of Automation and Electrometry, Russia), V. A. Markel (Professor at the University of Pennsylvania), S. V. Faleev (on scientific staff of the Sandia National Laboratories), K. B. Kurlayev (Georgia School System), L. S. Muratov (on scientific staff of Spectral Sciences, Inc., Boston, MA), T. Siddiqui (Lucent Technologies), and J. R. Evans (research faculty at the University of Central Florida), Prabath Hewageegana (Professor in Sri Lanka); Maxim Durach and Anastasia Rusina; Hamed Koochakikelardeh (Current student).

Research Scientists/Postdoctoral Associates: Dr. Kuiru Li, Dr. Xiangting Li (Research Scientist) and Dr. Daniel Brandl (Postdoctoral Associate), Dr, Maxim Durach, Dr. Anastasia Rusina, and Dr. Vladislav Yakovlev

5.4. Collaborations

I have a number of active and established collaborations. Some of them have already led to publications of papers and signing of contracts, others resulted in joined obtaining significant research grants, submissions of grant proposal, and research projects currently in progress. Major of them are listed below along with the researchers involved. There are collaborations with both experimentalists and theorists, presented approximately equally:

- David J. Bergman, Department of Physics, Tel Aviv University, Israel
- Sophie Brasselet, Institut Fresnel, Marseilles, France
- Paul Corkum, Femtosecond Science Program, National Research Council of Canada
- Maxim Durach, Georgia State University, Atlanta, GA, USA
- Sergey V. Faleev, Sandia National Laboratories, Livermore, CA, USA

- Enzo di Fabrizio, King Abdullah University of Science and Technology, Saudi Arabia
- Harald Giessen, University of Stuttgart, Germany
- Dmitry Gramotnev, Queensland University of Technology, Brisbane, Australia
- Misha Ivanov, Femtosecond Science Program, Max Born Institute, Berlin, Germany
- Ulf Kleineberg, Ludwig Maximilian University, Munich, Germany
- Victor Klimov, Los Alamos National Laboratory, Los Alamos, New Mexico, USA
- Matthias Kling, Max Plank Institute for Quantum Optics, Garching, Germany
- Katrin Kneipp, Technical University Copenhagen, Denmark
- Takayoshi Kobayashi, University of Tokyo, Japan
- Ferenc Krausz, Max Plank Institute for Quantum Optics, Garching, Germany
- Ivan Larkin, Georgia State University, Atlanta, GA, USA
- Kuiru Li, Georgia State University, Atlanta, GA, USA
- Keith Nelson, MIT, Boston, USA
- Peter Nordlander, Rice University, Houston, Texas, USA
- Hrvoje Petek, University of Pittsburgh, USA
- Anastasia Rusina, Georgia State University, Atlanta, GA, USA
- Igor Tsukerman, University of Akron, OH 44325, USA
- Nikolay Zheludev, University of Southampton, UK
- Joseph Zyss, Ecole Normale Supérieure de Cachan, France

6. Grants and Contracts

Current Grants and Contracts

- United States Department of Defense (Navy) Multidisciplinary University Research Initiative (MURI) Grant No. N00014-13-1-0649 *Novel Nonlinear Optical Processes in Active, Random and Nanostructured Systems*. Principal Investigator (PI): Mark I. Stockman, team universities: Georgia State University, Purdue University, University of Central Florida, University of California at Berkeley, Yale University, and Cornell University. This grant period is 36 months with an extension option of 24 months extra, starting September, 2013. PI's amount is **$1,370,010**; the total grant amount is **$7,200,000**

- United States Department of Defense (Air Force) Multidisciplinary University Research Initiative (MURI) Grant *Studying Ultrafast Electron Dynamics in Condensed Matter with Next Generation Attosecond X-Ray Sources*, PI: Zenghu Chang (University of Central Florida), team universities: Ohio State University, University of California at Berkeley, and Georgia State University. GSU co-PI: Mark I. Stockman, Started 03/01/2015, period: 5 years, GSU amount is **$445,672**

- United States Department of Energy Grant No. DE-FG02-01ER15213 *Novel Nanoplasmonic Theory*. Sole PI: Mark I. Stockman. This grant period is 36 months starting on in 2014. The total grant amount is **$300,000** from the US DOE, Program:

Atomic, Molecular, and Optical Science (AMOS). Chemical Sciences, Biosciences and Geosciences Division

- US Department of Energy Grant No. DE-FG02-11ER46789 *Quantum Nanoplasmonics*, Sole PI: Mark I. Stockman. This grant is in the total amount of **$429,000**. The grant period is 36 months starting 2014. Program: *Physical Behavior of Materials*, Materials Sciences and Engineering (MSE) Division.
- US NSF, Grant No. ECCS-1308473 *Nanoscale Solids in Strong and Ultrafast Optical Fields,* co-PI: Mark Stockman, co-PI's amount is **$75,000**. PI: Vadym Apalkov, total amount is **$316,488**.

Pending Grants and Contracts

- N/A

Completed Grants and Contracts

- US-Israel Binational Science Foundation Grant *Surface Plasmon Resonances in Metal/Dielectric Nanocomposites*, US PI: Mark I. Stockman. This grant period is 60 months starting on September 1, 2007. MIS's total amount is **$61,000**.
- Center for Advanced Studies at Ludwig Maximilian University (Munich, Germany), Grant (Stipend of **30,000 Euro** (approx. $42,000) for Project *Ultrafast Nanoplasmonics*, December 2008 – August 2009.
- United States Department of Energy Grant No. DE-FG02-01ER15213 *Novel Nanoplasmonic Theory*. Sole PI: Mark I. Stockman. This grant period is 36 months starting on November 1, 2007 and ending October 31, 2010. The total grant amount is **$300,000** from the US DOE.
- National Science Foundation Grant No. CHE-0507147 *NIRT: Full Spatio-Temporal Coherent Control on Nanoscale.* This grant is received with Massachusetts Institute of Technology and University of Pittsburgh. The total amount is **$1.3 million** for the period 2005-2009. PI: Mark I. Stockman, whose funding from this grant is **$260,000**.
- United States Department of Energy Grant No. DE-FG02-01ER15213 *Novel Nanoplasmonic Theory*. Sole PI: Mark I. Stockman. This grant period is 36 months starting on November 1, 2004 and ending October 31, 2007. The total grant amount is **$285,000** from the US DOE plus a $18,000 per annum matching for a postdoctoral associate salary from GSU.
- United States Department of Energy Grant No. DE-FG02-03ER15486 *Computational Nanophotonics: Model Optical Interactions and Transport in Tailored Nanosystem Architectures*. This grant is received with Argonne National Laboratory and Northwestern University. GSU PI: Mark I. Stockman. This grant period is 2003-2007. MIS's total amount (funded by DOE as a separate grant) is **$255,000**.
- United States Department of Energy Grant No. DE-FG02-01ER15213 *Femtosecond and Attosecond Laser-Pulse Energy Concentration and Transformation in Nanostructured Systems*. Sole PI: Mark I. Stockman. This grant period is 38 months starting on September 1, 2001 and ending on October 30, 2004 (see the Current Grants and Contracts for the continuing grant). The total grant amount is **$290,000** from the US DOE plus $18,000 match for equipment from GSU, plus $18,000 per annum match for a postdoctoral associate salary from GSU.
- US-Israel Binational Science Foundation Grant *Surface Plasmon Resonances in Metal/Dielectric Nanocomposites*, US PI: Mark I. Stockman. This grant period is 48 months starting on September 1, 2003. MIS's total amount is **$61,000**.

- Los Alamos National Laboratory Contract No. 69837-001-03 3R *Theory of Near-Field Optical Responses of Metal Nanostructures.* Sole PI: Mark I. Stockman. This contract period is 12 months starting 1 October 2002. The contract amount is **$30,000**.

7. Awards and Recognitions

- **American Physical Society (APS), Fellow**
- **Optical Society of America (OSA), Fellow**
- **SPIE – The International Society for Optical Engineering, Fellow**
    - Academic Icon for High Impact Research Professor, University of Malaya, Kuala Lumpur, 2014-2015
    - Guest Professor at Max Plank Institute for Quantum Optics (MPQ) (Garching, Germany) and Ludwig Maximilian University (Munich, Germany) at the Munich Center Advanced Photonics (MAP) and Center for Advanced Studies (CAS), December 2008 – August 2009; March 2013-2014
    - Visiting Professor for Senior International Scientists of the Chinese Academy of Sciences at Changchun Institute of Optics, Fine Mechanics, and Physics, China.
    - Guest Professor at the University of Stuttgart (Germany), September-November 2008.
    - Invited Distinguished Professor at Ecole Normale Supérieure de Cachan (France), June-July, 2008.
    - Invited Professor at Ecole Supérieur de Physique et de Chimie Industrielle, Paris, France, May - June, 2008.
    - Max Plank Research Award by the German Max-Plank-Gesellschaft for research on the subject "*Collective Electrodynamics in Ultrafast Plasmons*", January-February, 2007.
    - Invited Distinguished Professorship at Ecole Normale Supérieure de Cachan (France), March, 2006.

See also Grants and Contracts above in Sec. 6.

8. Teaching

This description with hyperlinks to related materials, including on-line information on the courses taught, is available on line at www.phy-astr.gsu.edu/stockman/data/teaching.html

I have an extensive teaching experience at both the undergraduate and graduate levels. This includes teaching in the US as a Visiting Professor in the Department of Physics, Washington State University, and a Visiting Scientist in the Department of Physics, State University of New York at Buffalo. I presently teach at Georgia State University Department of Physics and Astronomy. I also teach professional Short Course "Nanoplasmonics" at SPIE Photonics West and Optics and Photonics Meetings annually for over five years. This course also taught multiple times on invitations at other international meetings and various leading scientific institutions.

I have taught over 20 different courses in physics and related fields at both the undergraduate and graduate levels. The courses for which on-line materials are available are highlighted/underlined)

Undergraduate courses:

General Physics *(freshman level).*
http://www.phy-astr.gsu.edu/stockman/1111K/1111K.html and
http://www.phy-astr.gsu.edu/stockman/data/101spr96.html
Introductory Classical Mechanics (*Junior level*)
Quantum Mechanics *(Senior level)*
Statistical and Thermal Physics. *(Senior/graduate level).*
http://www.phy-astr.gsu.edu/stockman/data/7850sp.html *(Taught at GSU).*
Solid State Physics *(senior level)*

Graduate courses:

Mathematics of Physics II. (*Senior/graduate levels)*
http://www.phy-astr.gsu.edu/stockman/data/6520mp.html *(Taught at GSU).*
Intermediate Classical Mechanics (*Senior/graduate level)*
http://www.phy-astr.gsu.edu/stockman/461cm/classmech.htm
Advanved Classical Mechanics.
hhttp://www.phy-astr.gsu.edu/stockman/8010cm/8010cm.htm *(Taught at GSU).*
Advanced Statistical Physics. On line materials are available at
http://www.phy-astr.gsu.edu/stockman/data/8310sp.html *(Taught at GSU).*
Quantum Theory I and II *(Two semesters of advanced quantum mechanics)*
Solid State Physics
Atomic, Molecular, and Optical Physics
Nonlinear Optics and Spectroscopy
Physics of Laser-Induced Phenomena and Applications of Lasers
Quantum Many-Body Theory
Mathematica in Physics Simulations *(a part of* the Modern Physics Lab *(Taught at GSU).*
Computer Simulations in Physics

9. Professional Service

- US Department of Energy (DOE) Basic Energy Sciences (BES) Materials Sciences and Engineering Program Review expert panelist, Ames Laboratory, May 2010; Berkeley Laboratory (2013).

- Department of Defense (DoD) Army Research Office (ARO) Triennial Strategy Planning Meeting (SPM) expert participant, Durham, NC, November, 2011.
- Chairman of Conference *Metal Nanoplasmonics* at Optical Science and Technology (2005-2012 SPIE Annual Meetings) (San Diego, 2005-2010)
- Program Committee of International Conferences *Ultrafast Phenomena* 2006, 2008, and 2010.
- Co-Chair of the OSA Topical Meeting *Plasmonics and Metamaterials* (with Dr. Martin Wegener as the other Co-Chair), Tucson, AZ, 2010.
- Organizer and Chair of Special Session *Novel Nanooptics* at "Progress in Electromagnetic Research Symposium" (PIERS) 2003 (Honolulu, Hawaii), 2004 (Pisa, Italy), 2005 (Hangzhou, China), and 2007 (Beijing, China).
- Program Committee of Conference *Complex Mediums V: Beyond Linear Isotropic Dielectrics*" at Optical Science and Technology (2004-2008 SPIE Annual Meeting).
- Program Committee of the CLEO/QELS-2005 International Conference, Baltimore, USA, 2005.
- Program Committee of the CLEO/QELS-2005 Pacific Rim International Conference (Tokyo, Japan)
- Program Committee of Conference "*Complex Mediums IV: Light and Complexity*" at Optical Science and Technology (2004-2012 SPIE Annual Meetings).
- Expert Panel member of Deuche Forschungsgemeinschaft (German counterpart of the NSF) Excellence Initiative.
- Foreign Expert and Invited Speaker at Deuche Forschungsgemeinschaft Schwerpunktprogramme (German counterpart of NSF Focused Research Program), Bad Honnef, Germany, June 26, 2005. Expert panelist for Deutche Forschungsgemeinschaft (2006 Bonn, 2006 Frankfurt, 2007 Bonn, and 2012.
- Short Lecture Course *Nanoplasmonics* at SPIE 2005-2007 Optics and Photonics Meetings, San Diego, California, 2005 and 2006, and at 2006-2007 Photonics West Meeting, San Jose, California, 2006; ETOPIM International Conference (Sydney, Australia, 2006).
- Referee for Nature, Science, Physical Review Letters, Physical Review B, Proceedings of the National Academy of Sciences U.S.A., Surface Science, Physics Letters A, Optics Express, Journal of Chemical Physics, Journal of Optical Society of America, The Journal of Physical Chemistry, Europhysics Letters, Nano Letters, Office of Basic Energy Sciences of the US Department of Energy, National Science Foundation, Air Force Office of Scientific Research, Petroleum Fund, Binational US-Israel Science Foundation, National Sciences and Engineering Research Council of Canada (NSERC), and The Marsden Fund of New Zealand Government.
- Member of the Editorial Board, Light: Science and Applications (Nature Publishing Group), 2011-
- Member of the Editorial Board, Journal of Optics A: Pure and Applied Optics, 2004-2008.
- Member of the Editorial Board, The Open Physical Chemistry Journal, 2007-present
- Member of the Advisory Board, Metamaterials Journal (Elsevier), 2007-present.
- Guest Editor of the Topical Issue *Fundamental Aspects of Nanophotonics*, Journal of Optics A: Pure and Applied Optics **7**(4), 2005.

10.List of Selected Publications

This is a list of selected recent publications and new submissions. This list is reverse-chronologically ordered and numbered. A constantly updated List of Publications is available at http://www.phy-astr.gsu.edu/stockman/data/referenc.html. There are currently approx. **200** publications in this List. Also from this Web site, electronic reprints of the recent published papers are available as PDF files. Preprints of Submitted and Accepted for Publication papers are available upon request.

SUBMITTED

ACCEPTED FOR PUBLICATION

PUBLISHED

1. J. Schötz, B. Förg, M. Förster, W. A. Okell, M. I. Stockman, F. Krausz, P. Hommelhoff, and M. F. Kling, *Reconstruction of Nanoscale near Fields by Attosecond Streaking*, IEEE J. Sel. Top. Quant. Elec. **23**, 1-11 (2017).
2. A. S. Kirakosyan, M. I. Stockman, and T. V. Shahbazyan, *Surface Plasmon Lifetime in Metal Nanoshells*, Phys. Rev. B **94**, 155429 (2016).
3. Y. Abate, S. Gamage, Z. Li, V. Babicheva, M. H. Javani, H. Wang, S. B. Cronin, and M. I. Stockman, *Nanoscopy Reveals Surface-Metallic Black Phosphorus*, Light Sci. Appl. **5**, e16162-1-7 (2016).
4. H. K. Kelardeh, V. Apalkov, and M. I. Stockman, *Attosecond Strong-Field Interferometry in Graphene: Chirality, Singularity, and Berry Phase*, Phys. Rev. B **93**, 155434-1-7 (2016).
5. Y. Abate, D. Seidlitz, A. Fali, S. Gamage, V. E. Babicheva, V. S. Yakovlev, M. I. Stockman, R. Collazo, D. E. Alden, and N. Dietz, *Nanoscopy of Phase Separation in $In_xGa_{1-x}N$ Alloys*, ACS Appl. Mater. Inter. **8**, 23160−23166 (2016).
6. M. H. Javani and M. I. Stockman, *Real and Imaginary Properties of Epsilon-near-Zero Materials*, Phys. Rev. Lett. **117**, 107404-1-6 (2016).
7. B. Förg, J. Schötz, F. Süßmann, M. Förster, M. Krüger, B. Ahn, W. Okell, K. Wintersperger, S. Zherebtsov, A. Guggenmos, V. Pervak, A. Kessel, S. Trushin, A. Azzeer, M. Stockman, D. E. Kim, F. Krausz, P. Hommelhoff, and M. Kling, *Attosecond Nanoscale near-Field Sampling*, Nature Communications **7**, 11717-1-7 (2016)
8. M. S. Wismer, S. Y. Kruchinin, M. Ciappina, M. I. Stockman, and V. S. Yakovlev, *Strong-Field Resonant Dynamics in Semiconductors*, Phys. Rev. Lett. 197401-1-5 (2016).
9. C. Jayasekara, M. Premaratne, S. D. Gunapala, and M. I. Stockman, *MoS_2 Spaser*, J. Appl. Phys. **119**, 133101-1-8 (2016).
10. H. P. Paudel, V. Apalkov, and M. I. Stockman, *Three-Dimensional Topological Insulator Based Nanospaser*, Phys. Rev. B **93**, 155105 (2016).
11. O. Kwon, T. Paasch-Colberg, V. Apalkov, B.-K. Kim, J.-J. Kim, M. I. Stockman, and D. E. Kim, *Semimetallization of Dielectrics in Strong Optical Fields*, Sci. Rep, **6**, 21272-1-9 (2016).

12. V. S. Yakovlev, S. Y. Kruchinin, T. Paasch-Colberg, M. I. Stockman, and F. Krausz, *Ultrafast Control of Strong-Field Electron Dynamics in Solids*, in *Ultrafast Dynamics Driven by Intense Light Pulses*, edited by M. Kitzler and S. Gräfe (Springer International Publishing, 2016), Vol. 86, p. 295-315; arXiv:1502.02180.
13. C. Jayasekara, M. Premaratne, M. I. Stockman, and S. D. Gunapala, *Multimode Analysis of Highly Tunable, Quantum Cascade Powered, Circular Graphene Spaser*, J. Appl. Phys. **118**, 173101 (2015).
14. V. S. Yakovlev, M. I. Stockman, F. Krausz, and P. Baum, *Atomic-Scale Diffractive Imaging of Sub-Cycle Electron Dynamics in Condensed Matter*, Sci. Rep, **5**, 145811-1-13 (2015).
15. Y. Abate, R. E. Marvel, J. I. Ziegler, S. Gamage, M. H. Javani, M. I. Stockman, and R. F. Haglund, *Control of Plasmonic Nanoantennas by Reversible Metal-Insulator Transition*, Sci. Rep, **5**, 13997-1-8 (2015).
16. H. K. Kelardeh, V. Apalkov, and M. I. Stockman, *Ultrafast Field Control of Symmetry, Reciprocity, and Reversibility in Buckled Graphene-Like Materials*, Phys. Rev. B **92**, 045413-1-9 (2015).
17. Y. Abate, S. Gamage, L. Zhen, S. B. Cronin, H. Wang, V. Babicheva, M. H. Javani, and M. I. Stockman, *Nanoscopy Reveals Metallic Black Phosphorus*, arXiv:1506.05431, 1-9 (2015).
18. Mark I. Stockman, *Nanoplasmonic Sensing and Detection*, Science **348**, 287-288 (2015).
19. V. Apalkov and M. I. Stockman, *Theory of Solids in Strong Ultrashort Laser Fields*, in: *Attosecond Nanophysics*, edited by P. Hommelhoff and M. F. Kling (Wiley-VCH Verlag, Weinheim, Germany, 2014), p. 197-234.
20. M. I. Stockman, *Quantum Nanoplasmonics*, in: *Photonics, Volume II: Scientific Foundations, Technology and Applications*, D. L. Andrews, Ed. (John Wiley & Sons, Inc., Hoboken, NJ, USA, 2015), pp. 85-132.
21. H. K. Kelardeh, V. Apalkov, and M. I. Stockman, *Graphene in Ultrafast and Superstrong Laser Fields*, Phys. Rev. B **91**, 045439-1-8 (2015).
22. Ekaterina I. Galanzha, Robert Weingold, Dmitry A. Nedosekin, Mustafa Sarimollaoglu, Alexander S. Kuchyanov, Roman G. Parkhomenko, Alexander I. Plekhanov, Mark I. Stockman, and Vladimir P. Zharov, *Spaser as Novel Versatile Biomedical Tool*, arXiv:1501.00342 (2015)
23. M. I. Stockman, *Nanoplasmonics: Fundamentals and Applications*, in *Nano-Structures for Optics and Photonics*, edited by B. di Bartolo and et al. (Springer Netherlands, 2015).
24. S. Ghimire, G. Ndabashimiye, A. D. DiChiara, E. Sistrunk, M. I. Stockman, P. Agostini, L. F. DiMauro, and D. A. Reis, *Strong-Field and Attosecond Physics in Solids*, J. Phys. B: Atom. Mol. Opt. Phys. **47**, 204030-1-10 (2014).
25. M. Stockman, *Plasmonic Lasers: On the Fast Track*, Nat. Phys., doi: 10.1038/nphys3127 (2014).
26. H. K. Kelardeh, V. Apalkov, and M. I. Stockman, *Wannier-Stark States of Graphene Monolayer in Strong Electric Field*, arXiv:1405.1141 (2014); Phys. Rev. B **90** 085313-1-11 (2014).

27. T. Higuchi, M. I. Stockman, and P. Hommelhoff, *Strong-Field Perspective on High-Harmonic Radiation from Bulk Solids*, Phys. Rev. Lett. **113**, 213901-1-5 (2014).
28. Y.-J. Lu, C.-Y. Wang, J. Kim, H.-Y. Chen, M.-Y. Lu, Y.-C. Chen, W.-H. Chang, L.-J. Chen, M. I. Stockman, C.-K. Shih, and S. Gwo, *All-Color Plasmonic Nanolasers with Ultralow Thresholds: Autotuning Mechanism for Single-Mode Lasing*, Nano Lett., **14**, 4381–4388 (2014).
29. Vadym Apalkov and Mark I. Stockman, *Proposed Graphene Nanospaser*, arXiv:1303.0220 [cond-mat.mes-hall] (2013); Light: Science and Applications **3**, e191-1-6 (2014)
30. Ferenc Krausz and Mark I. Stockman, *Attosecond metrology: from capturing electrons toward speeding up signal processing*, Nat. Phot. **8**, 205-213 (2014).
31. F. Süßmann, S. L. Stebbings, S. Zherebtsov, S. H. Chew, M. I. Stockman, E. Rühl, T. Fennel, U. Kleineberg, and M. F. Kling, *Attosecond Nanophysics*, in *Attosecond and XUV Spectroscopy: Ultrafast Dynamics and Spectroscopy*, edited by T. Schultz and M. Vrakking (John Wiley & Sons, 2014)
32. T. Paasch-Colberg, A. Schiffrin, N. Karpowicz, S. Kruchinin, Saglam Ozge, S. Keiber, O. Razskazovskaya, S. Muhlbrandt, A. Alnaser, M. Kubel, V. Apalkov, D. Gerster, J. Reichert, T. Wittmann, J. V. Barth, M. I. Stockman, R. Ernstorfer, V. S. Yakovlev, R. Kienberger, and F. Krausz, *Solid-State Light-Phase Detector*, Nat. Phot. **8**, 214–218 (2014).
33. P. Hommelhoff, M. F. Kling, and M. I. Stockman, *Ultrafast Phenomena on the Nanoscale*, Ann Phys-Berlin **525**, A13-A14 (2013).
34. Vadym Apalkov and Mark I. Stockman, *Metal Nanofilm in Strong Ultrafast Optical Fields*, arXiv:1209.2245 [cond-mat.mes-hall]; Phys. Rev. B **88**, 245438-1-7 (2013).
35. M. I. Stockman, *Nanoplasmonics: From Present into Future*, in *Plasmonics: Theory and Applications*, edited by T. V. Shahbazyan and M. I. Stockman (Springer Netherlands, 2013), Vol. 15, p. 1-101.
36. M. I. Stockman, *Lasing Spaser in Two-Dimensional Plasmonic Crystals*, NPG Asia Mater **5**, e71-e71 (2013).
37. A. Giugni, B. Torre, A. Toma, M. Francardi, M. Malerba, A. Alabastri, R. Proietti Zaccaria, M. I. Stockman, and E. Di Fabrizio, *Hot-Electron Nanoscopy Using Adiabatic Compression of Surface Plasmons*, Nat. Nano, **8,** 845–852 (2013).
38. Mark I. Stockman, *Spaser, Plasmonic Amplification, and Loss Compensation*, in: *Active Plasmonics and Tunable Plasmonic Metamaterials*, edited by A. V. Zayats and S. Maier (John Wiley and Sons, Hoboken, NJ, 2013).
39. Dabing Li and Mark I. Stockman, *Electric Spaser in the Extreme Quantum Limit*, Phys. Rev. Lett. **110**, 106803-1-5 (2013); arXiv:1211.0366 [cond-mat.mes-hall] 1-5 (2012).
40. Agustin Schiffrin, Tim Paasch-Colberg, Nicholas Karpowicz, Vadym Apalkov, Daniel Gerster, Sascha Mühlbrandt, Michael Korbman, Joachim Reichert, Martin Schultze, Simon Holzner, Johannes Barth, Reinhard Kienberger, Ralph Ernstorfer, Vladislav S. Yakovlev, Mark I. Stockman, and

Ferenc Krausz, *Optical Field-Induced Current in Dielectrics,* Nature, **493**, 70-74 (2013).

41. Martin Schultze, Elisabeth Bothschafter, Annkatrin Sommer, Simon Holzner, Markus Fiess, Michael Hofstetter, Reinhard Kienberger, Vadym Apalkov, Vladislav S. Yakovlev, Mark I. Stockman, and Ferenc Krausz, *Controlling Dielectrics with the Electric Field of Light*, Nature **493**, 75-78 (2013).
42. Vadym Apalkov and Mark I. Stockman, *Theory of Dielectric Nanofilms in Strong Ultrafast Optical Fields,* Phys. Rev. B **86**, 165118-1-13 (2012).
43. S. H. Chew, F. Sussmann, C. Spath, A. Wirth, J. Schmidt, S. Zherebtsov, A. Guggenmos, A. Oelsner, N. Weber, J. Kapaldo, A. Gliserin, M. I. Stockman, M. F. Kling, and U. Kleineberg, *Time-of-Flight-Photoelectron Emission Microscopy on Plasmonic Structures Using Attosecond Extreme Ultraviolet Pulses*, Appl. Phys. Lett. **100**, 051904-4 (2012). doi: 10.1063/1.3670324.
44. M. I. Stockman, *Nanoplasmonics: Past, Present, and Glimpse into Future*, Opt. Express **19**, 22029-22106 (2011). doi: 10.1364/OE.19.022029.
45. I.-Y. Park, S. Kim, J. Choi, D.-H. Lee, Y.-J. Kim, M. F. Kling, M. I. Stockman, and S.-W. Kim, *Plasmonic Generation of Ultrashort Extreme-Ultraviolet Light Pulses*, Nat. Phot. (2011). doi: 10.1038/nphoton.2011.258.
46. M. I. Stockman, *Loss Compensation by Gain and Spasing*, Phil. Trans. R. Soc. A **369**, 3510-3524 (2011). doi: 10.1098/rsta.2011.0143.
47. S. L. Stebbings, F. Süßmann, Y.-Y. Yang, A. Scrinzi, M. Durach, A. Rusina, M. I. Stockman, and M. F. Kling, *Generation of Isolated Attosecond Extreme Ultraviolet Pulses Employing Nanoplasmonic Field Enhancement: Optimization of Coupled Ellipsoids*, New J. Phys. **13**, 073010 (2011). doi:10.1088/1367-2630/13/7/073010.
48. M. Durach, A. Rusina, M. Kling, and M. I. Stockman, *Predicted Ultrafast Dynamic Metallization of Dielectric Nanofilms by Strong Single-Cycle Optical Fields*, arXiv:1104.1642 (2011); Phys. Rev. Lett. **107**, 086602-1-5 (2011).
49. S. Zherebtsov, T. Fennel, J. Plenge, E. Antonsson, I. Znakovskaya, A. Wirth, O. Herrwerth, F. Suessmann, C. Peltz, I. Ahmad, S. A. Trushin, V. Pervak, S. Karsch, M. J. J. Vrakking, B. Langer, C. Graf, M. I. Stockman, F. Krausz, E. Ruehl, and M. F. Kling, *Controlled near-Field Enhanced Electron Acceleration from Dielectric Nanospheres with Intense Few-Cycle Laser Fields*, Nature Physics **7**, 656-662 (2011).
50. M. I. Stockman, *Nanoplasmonics: The Physics Behind the Applications*, Physics Today **64**, 39-44 (2011).
51. M. I. Stockman, *Spaser Action, Loss Compensation, and Stability in Plasmonic Systems with Gain,* arXiv:1011.3751 [cond-mat.mes-hall], 1-4 (2010); Phys. Rev. Lett. **106**, 156802-1-4 (2011).
52. M. I. Stockman, *A Fluctuating Fractal Nanoworld*, Physics **3**, 90 (2010).
53. M. I. Stockman, *Dark-Hot Resonances*, Nature **467**, 541-542 (2010).
54. M. Durach, A. Rusina, M. F. Kling, and M. I. Stockman, *Metallization of Nanofilms in Strong Adiabatic Electric Fields*, Phys. Rev. Lett. **105**, 086803-1-4 (2010).

55. A. Rusina, M. Durach, and M. Stockman, *Theory of Spoof Plasmons in Real Metals*, Appl. Phys. A **100**, 375-1-4 (2010)
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11. Selected Conference Talks and Lectures

1. *Condensed Matter in Ultrafast and Superstrong Fields: Attosecond Phenomena* (Invited Talk), Nanometa2015 – The 5th International Topical Meeting on Nanophotonics and Metamaterials, 05/01/2015 – 08/01/2015, Seefeld, Austria.
2. *Spaser in Quantum Regime* (Invited Talk), International Workshop on Electron Dynamics on Surfaces and Nanostructures, CECAM, Zaragoza, Spain, November 6, 2014.
3. *Ultrafast Processes in Strong Laser Fields in Nanostructured Systems* (Invited Talk), 2014 DOE AMOS Grantees' Meeting, Potomac, MD, October 27, 2014
4. *Solids in Superstrong and Ultrafast Optical Fields* (Invited Talk), The Extreme Light Infrastructure – Attosecond Light Pulse Source (ELI-ALPS) 2nd User Workshop, Szeged, Hungary, 11-12 September, 2014.

Solids in Ultrafast and Strong Optical Fields: New Phenomena (Invited Talk), International Conference on Atomic Probe Tomography and Microscopy (APTM), September 2, 2014, University of Stuttgart, Germany.

5. *Quantum Nanoplasmonics: Nanospaser and Amplification* (Invited Talk), International Conference LHYS'14, Sophia, Bulgaria, July, 2014.
6. *Spaser: Plasmonic Laser and Amplification* (Invited Talk), The 3rd International Conference on Advanced Lasers and Photon Sources (ALPS'14), Yokohama, Japan, Apr. 22 - Apr. 25, 2014.
7. *Solids and Intense Light Field* (Invited Talk), International Symposium on Ultrafast Intense Laser Science (ISUILS'2013), Salamanca, Spain, October 8. 2013.
8. *Gain and Spasers* (Invited Talk), The International Conference on Surface Plasmon Photonics SPP6, Ottawa, Canada, May 29, 2013.
9. *Spaser in Quantum Regime* (Invited Talk), 1st EOS Topical Meeting on Optics at the Nanoscale (ONS'13), Capri, Italy, September 13, 2013.
10. *Nanoplasmonics* (Short Course SC727), 2013 SPIE Optics and Photonics Meeting, San Diego, CA, August 29, 2013.
11. *Solids in Ultrafast and Strong Optical Fields: New Phenomena* (Invited Talk), 2013 SPIE Optics and Photonics Meeting, San Diego, CA, August 27, 2013.
12. *Solids in Ultrafast and Strong Optical Fields* (Invited Talk), DOE Physical Behavior of Materials 2013 Contractors Meeting, Potomac, MD, April 15, 2013.
13. *Solids in Ultrafast and Strong Optical Fields: New Phenomena* (Invited Talk), Nano and Photonics Conference, Mauterndorf, Austria, 03/22/2013.
14. *Attosecond Science in Plasmonics* (Invited Talk), AAAS 2013 Annual Meeting, Boston. MA, February 17, 2013.
15. *Nanoplasmonics* (Short Course SC727), SPIE Photonics West Meeting, San Francisco, CA, CA, 02/2-7/2013.

16. *Solids in Ultrafast and Strong Optical Fields: New Phenomena* (Invited Talk), 2013 SPIE Photonics West Conference, San Francisco, CA, 02/2-7/2013.
17. *Applied Nanoplasmonics* (Invited Lecture), Nanophotonics for Detection and Sensing Symposium, Technion – Israel Institute of Technology, Haifa, Israel, 01/20-21/2013.
18. *Theory of Nanoplasmonics* (Invited Lecture), Summer School on Nanophotonics, Bad Herrenalb, Germany, September 9-13, 2012, Karlsruhe Institute of Technology and Center for Functional Nanostructures.
19. *Quantum nanoplasmonics and the SPASER* (Invited Talk), The 17-th Workshop on Microchip Plasmonics, Erlangen, Germany, 29-31 August, 2012.
20. *Spasing and Amplification in Plasmonic Nanosystems* (Invited Talk), The 12-th International Conference on Near-Field Optics, Nanophotonics, and Related Technologies, Donostia/San Sebastian, Basque Country, Spain, 3-7 September, 2012.
21. *From Classical to Quantum Nanoplasmonics and Spaser,* The First Nanotechnology and Nanomanufacturing Summit (NNS2012), 11-12 April, 2012, Xian Jiatong University, China.
22. *Nanoplasmonics.* (Short Course), Winter College *Optics: Advances in Nano-Optics and Plasmonics*, Abdus Salam International Center for Theoretical Physics (ICTP), Trieste, Italy, 6-17 February, 2012, Trieste, Italy.
23. *Nanoplasmonics* (Short Course SC727), SPIE Photonics West Meeting, San Francisco, CA, January 25, 2012.
24. *Metallization of Nanofilms in Strong THz and Optical Fields* (Invited Talk), The 42-nd Winter Colloquium on Physics of Quantum Electronics, Snowbird, UT, January 3, 2012.
25. *Nanoplasmonics* (Invited Lecture), "Nonlinear Optics and Complexity in Photonic Crystal Fibers and Nanostructures", International School on Complexity (XIV Corso). Ettore Majorana Foundation and Centre for Scientific Culture, Erice, Italy, 8-13 November 2011.
26. *Quantum Nanoplasmonics and the Spaser* (Invited Talk), 491-st Wilhelm and Else Heraeus Seminar, Physics Center, Bad Honnef, Germany, October 19, 2011.
27. *Quantum Nanoplasmonics and the Spaser* (Invited Talk), Stanford Photonics Research Center (SPRC) 2011 Annual Symposium September 13, 2011.
28. ***S**paser action, Loss Compensation, and Stability in Plasmonic Systems with Gain* (Invited Paper), SPIE 2011 Optics and Photonics Meeting, San Diego, CA, August 23, 2011.
29. *Strongly Driven Electron Emission from Nanoparticles in Few-Cycle Laser Fields* (Keynote Presentation), (Sergey Zherebtsov, Frederik Susmann, Jurgen Plenge, Johannes Passig, Christina Graf, Valerie Mondes, Mark I. Stockman, Eckart Ruhl, Thomas Fennel, and Matthias F. Kling), SPIE 2011 Optics and Photonics Meeting, San Diego, CA, August 23, 2011.
30. *Adiabatic and Nonadiabatic Metallization of Dielectric Nanofilms by Strong Optical Fields* (Invited Paper), (Mark I. Stockman, Maxim Durach, Anastasia Rusina, Matthias F. Kling), SPIE 2011 Optics and Photonics Meeting, San Diego, CA, August 23, 2011.
31. *Nanoplasmonics in Direct Band-Gap Semiconductors*, Nikolaus Dietz, Mark I. Stockman, SPIE 2011 Optics and Photonics Meeting, San Diego, CA, August 23, 2011.
32. *Plasmonics Theory* (Short Course), Ettore Majorana Foundation and Centre for Scientific Culture, International School of Atomic and Molecular Spectroscopy, Nano-Optics for Enhancing Light-Matter Interactions on a Molecular Scale: Plasmonics, Photonic Crystals, Metamaterials and Sub-Wavelength Resolution, a NATO Advanced Study Institute, International School of Atomic and Molecular Spectroscopy, Erice, Sicily, Italy; July 3 – 18, 2011.
33. *Nanoplasmonics: Faster, Smaller, Stronger* (Invited Talk), International Conference on Micro/Nano Optical Engineering (ICOME 2011), Chinese Institute of Optics, Fine

Mechanics and Physics (CIOMP), Chinese Academy of Sciences, June 13, 2011, Changchun, China.

34. *Loss compensation and Spasing in Plasmonic Metamaterials* (Talk THD-5), International Conference Surface Plasmon Photonics 5 (SPP5), Busan, S. Korea, May 19, 2011.
35. *Nonlinear Nanoplasmonics* (Invited Talk), SPIE Optics and Optoelectronics Meeting, Prague (Czech Republic), April 18-21, 2011.
36. *Nanoplasmonics (Short Course SC727),* SPIE 2011 Photonics West Conference, San Francisco, CA, January 26, 2011.
37. *Trends in Nanoplasmonics: Ultrasmall, Ultrafast, Ultrastrong* (Invited Talk), SPIE 2011 Photonics West Conference, San Francisco, CA, January 25, 2011.
38. *Metallization of Nanofilms in Strong Adiabatic Fields* (Breakthrough Talk) (Mark I. Stockman, Maxim Durach, Anastasia Rusina, and Matthias F. Kling), The 3d International Conference on Nanophotonics and Metamaterials, Seefeld, Austria, January 3, 2011.
39. *Trends in Nanoplasmonics: Smaller, Faster, Stronger* (Plenary Talk), European Optical Society Annual Meeting 2010 (EOSAM2010), 26 October 2010 - 29 October 2010, Paris, France
40. *Trends in Nanoplasmonics: Ultrafast, Ultrasmall, Ultrastrong* (Invited talk), Passion for Knowledge International Conference, Donostia International Physics Center, Donostia/San Sebastian, Spain, September 30, 2010.
41. *Implications of Causality on Metamaterial Losses* (Invited Lecture), 16th European Doctoral School on Metamaterials, Karlsruhe, Germany, September 17, 2010.
42. *The SPASER* (Invited Lecture), 16th European Doctoral School on Metamaterials, Karlsruhe, Germany, September 17, 2010.
43. *SPIDER: A new THz nonlinear effect in nanostructures* (Invited talk) (Mark I. Stockman, Anastasia Rusina, Maxim Durach), Fourth International Congress on Advanced Electromagnetic Materials in Microwaves and Optics “Metamaterials 2010”, Karlsruhe, Germany, 13-16 September, 2010.
44. *Nanoplasmonics* (Short Course), SPIE Optics and Photonics Meeting, San Diego, CA, August 5, 2010.
45. *Spaser as Nanoscale Optical Generator and Ultrafast Nano-Amplifier* (Invited Paper), SPIE Optics and Photonics Meeting, San Diego, CA, August 02, 2010, Paper 7754-1.
46. *Nanoplasmonics,* In: Lecture Course CLXXVII - "Advanced Methods in Optical Fluorescence Microscopy Towards Nanoscopy", International School of Physics "Enrico Fermi", Varenna, Lake of Como, Italy, 12 - 16 July 2010; Lecture 1; Lecture 2.
47. *Theory of Spoof Plasmons in Real Metals* (Anastasia Rusina, Maxim Durach, Mark I. Stockman), OSA Photonic Metamaterials and Plasmonics (META) Meeting, June 7-8, 2010, The Westin La Paloma, Tucson, AZ (USA).
48. *Giant Surface-Plasmon-Induced Drag Effect,* (Maxim Durach, Anastasia Rusina, Mark I. Stockman), OSA Photonic Metamaterials and Plasmonics (META) Meeting, June 7-8, 2010, The Westin La Paloma, Tucson, AZ (USA).
49. *Spasers, Nanolasers, and Ultrafast Plasmonics (Invited Talk),* The Royal Society (London) Theo Murphy Meeting "Metallic Metamaterials and Plasmonics", Kavli Center, Wednesday 2 - Thursday 3 June, 2010.*Ultrafast Dynamics of the Spaser as a Quantum Generator and Nanoamplifier* (Invited Talk), Gordon Research Conference “Ultrafast Phenomena in Cooperative Systems”, Galveston, TX, February 28-March 5, 2010.
50. *Nanoplasmonics: Phenomena and Applications* (Plenary Talk), 2010 Korean Nanooptics Society Winter Workshop, Muju, S. Korea, February 25, 2010.
51. *Nanoplasmonics* (Short Course SC-727), 2010 SPIE Photonics West Meeting, San Francisco, CA, January 25, 2010.

52. *New Horizons of Nanoplasmonics: SPASER, Nanolasers, and Attoseconds* (Tutorial Talk), Conference on Nanolasers, IEEE Photonics Society Winter Topicals, 11-13 January 2010, Mallorca, Spain.
53. *Nanoplasmonics* (Short Course), Instrument Technology Research Center (ITRC), Hsinchu, Taiwan, December 14, 2009.
54. *Nanoplasmonics* (Short Course), International Conference COMCAS 2009, Tel Aviv, Israel, November 12, 2009
55. *Nanoplasmonics* (Short Course), Italian Institute of Technology, October 23, 2009
56. *Nanoplasmonics: From Spaser to Attoseconds* (Invited Talk), International Conference on Theoretical and Computational Nanophotonics (TaCoNa), Bad Honnef, Germany, October 26, 2009.
57. *Nanoplasmonics* (Short Course), International Summer School *Dissipation at Surfaces*, University of Duisburg-Essen, Germany, September 30, 2009.
58. *Nanoplasmonics* (Short Course), International Summer School *New Frontiers in Optical Technologies*, Tampere University of Technology, Finland, August 14, 2009.
59. *Ultrafast Active Nanoplasmonics* (Invited Talk), 2009 SPIE Optics and Photonics Meeting, San Diego, CA, August 3, 2009.
60. *Nanoplasmonics* (Short Course), SPIE Optics and Photonics Meeting, San Diego, CA, August 6, 2009.
61. *New Horizons of Nanoplasmonics: From SPASER to Attoseconds* (Invited Lecture), International Conference on Materials for Advanced Technologies (ICMAT 2009), Singapore, 2009.
62. *New Horizons of Nanoplasmonics: From Attoseconds to Terahertz* (Keynote Talk), World of Photonics Congress, CLEO/Europe 2009, International Congress Center Munich, Munich, Germany, Tuesday, June 16, 2009, 4:30-5:30 pm.
63. *New Horizons of Nanoplasmonics* (Tutorial Talk), CLEO/IQEC 2009 Conference, Baltimore Convention Center, Baltimore, Md, June 2, 2009, 4:45-5:45 pm.
64. *New Horizons of Nanoplasmonics* (Keynote Talk), 6th Annual Charlotte Research Institute. Conference, Center for Optoelectronics and Optical Communications, UNC Charlotte, NC, USA, Thursday, May 28, 2009, 8:30-9:30 am.
65. *Ultrafast Nonlinear, and Active Nanoplasmonics: Fundamentals and Applications* (Tutorial), 2009 APS March Meeting, Pittsburgh, PA, March 15, 2009, http://www.aps.org/meetings/march/events/tutorials/3.cfm.
66. *Ultrafast, Nonlinear, and Quantum Nanoplasmonics* (Invited Talk), Conference "Nano and Photonics", Mauterndorf, Austria, March 11, 2009, http://www.nanoandphotonics.at/download/NaP2009_programm.pdf.
67. *Ultrafast Nonlinear, and Active Nanoplasmonics* (Invited Talk), 5th ADLIS Workshop, March 2-4, 2009, Munich, Germany.
68. *Nanoplasmonics: Trends and Progress* (Keynote Presentation), Korean Symposium on Nanooptics, Muju, S. Korea, February 24-27, 2009.
69. *Nanoplasmonics from Attoseconds to Terahertz* (Invited Talk), Mark Stockman, International Conference FRISNO-10, Ein Gedi, Israel, February 10, 2009, http://www.weizmann.ac.il/frisno/pdf/abstracts.pdf.
70. *Nanoplasmonics* (Short Course), SPIE Photonics West Conference, San Jose, Ca, January 29, 2009.
71. *Nanoplasmonics from Attoseconds to Terahertz* (Invited Talk), Mark Stockman, NanoMeta International Conference, Seefeld, Austria, January 7, 2009, http://www.nanometa.org/documents/prog.pdf.
72. *Highly Efficient Spatio-Temporal Coherent Control in Nanoplasmonics on Nanometer-Femtosecond Scale by Time-Reversal* (Invited Talk), Mark Stockman and Xiangting Li, Nanoplasmonics and Metamaterials Conference at 2008 OSA Frontiers in Optics Meeting, Rochester (NY), October 21, 2008.

73. *Attosecond Nanoplasmonic-Field Microscope* (Invited Paper), M.I. Stockman, U. Kleineberg, M. Kling, F. Krausz, AVS 55th International Symposium and Exhibition, Boston (MA), Monday, October 20, 2008, 2:00pm.
74. *Ultrafast, Nonlinear, and Quantum Nanoplasmonics* (Invited Talk), Workshop "Advances in Nonlinear Optics", University of Rome "La Sapienza", October 8-10, 2008.
75. *Ultrafast and Quantum Nanoplasmonics* (Keynote Talk), 2nd Metamaterials International Congress, Pamplona, Spain, September 24, 2008.
76. *Nanoplasmonics*, Lecture Course, University of Stuttgart and Max Plank Institute for Solid State Physics, Stuttgart, Germany, September-November, 2008.
77. *Nanoplasmonics*, Lecture Course, Center for Functional Nanostructures (CFN), University of Karlsruhe, Summer School on Nanophotonics, Bad Herrenalb, Germany, August 21, 2008.
78. *Terahertz Plasmonic Energy Concentration* (Invited Paper), Mark I. Stockman, Maxim Durach, Anastasia Rusina. Paper [7029-22], SPIE Optics and Photonics Meeting, San Diego, CA, August 11, 2008.
79. *Femtosecond Modulation of Surface Plasmon-Polariton Propagatio*n, Kevin F. MacDonald, Zsolt Samson, Nikolay I. Zheludev, Mark I. Stockman. Paper [7032-14], SPIE Optics and Photonics Meeting, San Diego, CA, August 10, 2008.
80. *Nanoplasmonic Renormalization and Enhancement of Coulomb Interactions*, Maxim Durach, Anastasia Rusina, Victor I. Klimov, Mark I. Stockman, Paper. [7032-18], SPIE Optics and Photonics Meeting, San Diego, CA, August 11, 2008.
81. *Attosecond Nanoplasmonic Field Microscope* (Invited Paper), Mark I. Stockman, Matthias F. Kling, Ulf Kleineberg, Ferenc Krausz. Paper [7033-12], SPIE Optics and Photonics Meeting, San Diego, CA, August 10, 2008.
82. Short Course SC727 *Nanoplasmonics*, Mark I. Stockman, Thursday, August 14, 2008, 8:30 am to 5:30 pm, SPIE Optics and Photonics Meeting, San Diego, CA.
83. *Nanoplasmonics,* Short Lecture Course, l'Ecole Supérieure de Physique et de Chimie Industrielles de la ville de Paris (France), June 29-July 1, 2008.
84. *Nanoplasmonics and Molecules,* Short Lecture Course, MONABIPHOT 2008 Summer School, Erasmus Mundus Program, Porquerolles Island (France), June 19-27, 2008.
85. *Attosecond Nanoplasmonic Field Microscope*, XVI International Conference on Ultrafast Phenomena, Stresa, Italy, June 9-13, 2008.
86. *Ultrafast and Quantum Plasmonics* (Invited Talk), International Conference on Ultrafast Phenomena, San Sebastian, Spain, May, 2008.
87. *Terahertz Plasmonics* (Invited Talk), The International IEEE Conference on Microwaves, Communications, Antennas and Electronic Systems (COMCAS 2008), Tel Aviv, Israel, May 13-14, 2008.
88. *Coherent, Nonlinear, and Ultrafast Nanoplasmonics* (Invited Talk) (Paper number: 266), Session: Spectroscopy, Chemistry, and Imaging through Nanophotonics, 2008 National Meeting of the American Chemical Society in New Orleans, April 6-10, 2008.
89. *Nanoplasmonics I: Theory*, Tutorial at MRS Spring Meeting, San Francisco, CA, March 14, 2008.
90. *Ultrafast Nanoplasmonics and Coherent Control on Nanoscale*, International Workshop on Nanooptics, Muju, South Korea, February, 2008.
91. *Ultrafast Phenomena in Metal-Dielectric and Metal-Semiconductor Nanostructures* (Invited Talk), Mark I. Stockman, SPIE 2008 Photonics West Conference, San Jose, CA, Talk #6892-17
92. *Energy Transfer and Spaser in Semiconductor Quantum Dots on Metal Nanoparticles*, (Invited Talk), Mark I. Stockman, SPIE 2008 Photonics West Conference, San Jose, CA, Talk #6889-22.

93. *Nanoplasmonics in Biology and Medicine* (Keynote Talk), Workshop on Plasmonics in Biology and Medicine, l'Ecole Supérieure de Physique et de Chimie Industrielles de la ville de Paris (France), December 14, 2007.
94. *Nanoplasmonics: Generation and Control of Nanoscale Optical Fields* (Invited Talk), Mark I. Stockman, CIFAR (Canadian Institute for Advanced Research) Nanoelectronics Program Meeting, Vancouver (BC, Canada), November 9, 2007.
95. *Nanoplasmonics: Generation and Control of Nanoscale Optical Fields* (Invited Talk), Mark I. Stockman, LEOS Workshop on Nanoplasmonics, Boston (MA, USA), November 7, 2007.
96. *Nanoplasmonics: Generation and Control of Nanoscale Optical Fields* (Invited Talk), Mark I. Stockman, First International Congress on Advanced Electromagnetic Materials in Microwaves and Optics (Metamaterials 2007), Rome (Italy), October 22, 2007.
97. *Ultrafast Coherent Control of Surface Plasmons,* (Invited Talk), Mark I. Stockman AVS 54th International Symposium and Exhibition, Seattle (WA. USA), October 15, 2007.
98. *Full Coherent Control on Nanoscale* (Invited Talk), Mark I. Stockman 2007 Frontiers in Optics Conference, OSA, September 29, 2007, San Jose (CA, USA) Paper #FThI2.
99. *Causality Principle and Negative Refraction with Illustrations From Surface Plasmon Polaritonic*s (Invited Paper), M. I. Stockman, 2007 SPIE Optics and Photonics Meeting, San Diego (CA, USA), August 26, 2007, Talk # [6638-09].
100. *Ultrafast nanoplasmonics* (Invited Paper)**,** M. I. Stockman, 2007 SPIE Optics and Photonics Meeting, San Diego (CA, USA), August 27, 2007, Talk #[6641-22].
101. *Attosecond Nanoplasmonic Field Microscope,* Mark I. Stockman (Invited Talk), Workshop *Attosecond Physics*, Institute of Complex Systems, Dresden (Germany
102. *Coherent, Nonlinear, and Ultrafast Nanoplasmonics,* Mark I. Stockman (Invited Talk), Third International Conference on Surface Plasmon Photonics, Université de Bourgogne, Dijon, June 17-2, 2007 (Talk MoO18).
103. *Ultrafast and Nonlinear Nanoplasmonics,* Mark I. Stockman (Invited Talk), Workshop on Properties and Applications of Random Electromagnetic Fields 2007, University of Central Florida, Orlando, May 3-4, 2007
104. *Slow Propagation, Anomalous Absorption and Total External Reflection of Surface Plasmon Polaritons in Nanolayer Systems*, Mark I. Stockman; CLEO/QELS 2007, Baltimore Convention Center, Baltimore, MD, May 6-11, 2007 (Talk QThB5, Thursday, May, May 10, 2007 at 9:15 am).
105. *Fundamental Causality and a Criterion of Negative Refraction with Low Optical Losses,* Mark I. Stockman; CLEO/QELS 2007, Baltimore Convention Center, Baltimore, MD, May 6-11, 2007 (Talk QMJ2, Monday, May, May 7, 2007 at 4:15 pm).
106. *Nanoplasmonics and Optics of Metamaterials,* Invited talk at the March Meeting of American Physical Society, Denver, CO, March 9, 2007.
107. *Nanoscale Energy Concentration in Nanosystems,* Invited talk at Workshop Energy Transfer from Microscale to Nanoscale, DOE, Santa Fe, NM, March 12, 2007.
108. *Ultrafast Nanoplasmonics,* Invited Talk at the Spring Meeting of German Physical Society, Regensburg, Germany, March 25, 2007.
109. *Causality and Negative Refraction* (Invited talk), International Workshop "Plasmonics and Applications for Nanotechnologies" in Singapore; 5-7 December 2006.
110. *Nanoplasmonics* (Invited Short Course), Photonics West 2007, San Jose, CA, January 21-26 (Short Course given on Thursday, January 25)
111. *Nanoplasmonics: Generation and Control of Nanoscale Optical Fields* (Invited Talk), First European Topical Meeting on Nanophotonics and Metamaterials (NANOMETA 2007), Seefeld, Tirol, Austria, January 8-11, 2007.
112. *Fundamental Causality and Negative Refraction Metamaterials,* (Invited Talk), First European Topical Meeting on Nanophotonics and Metamaterials (NANOMETA 2007), Seefeld, Tirol, Austria, January 8-11, 2007.

113. *Nanoplasmonics: Generation and Control of Nanoscale Optical Fields* (Invited talk) International Workshop "Plasmonics and Applications for Nanotechnologies" in Singapore; 5-7 December 2006.
114. *Extreme Nanoplasmonics: Spatio-Temporal Limits of Optical Processes in Nanostructured Systems* (Invited Talk), The 36th Winter Colloquium on the Physics of Quantum Electronics, January 2-6 2006, in Snowbird, Utah.
115. *Nanoplasmonics* (Invited Short Course), Photonics West 2006, San Jose, CA, January 25-27 (Short Course given on Thursday, January 26)
116. *Nanoplasmonics: Generation and Control of Nanoscale Optical Fields* (Invited Talk), ETOPIM 7 Conference, July 9-12, 2006, Dockside, Cockle Bay, Darling Harbour, Sydney, Australia.
117. *Nanoplasmonics* (Invited Short Course), University of Technology Sydney, July 13, 2006 (University of Sydney and University of Technology Sydney), Sydney, Australia.
118. *Spasers, Tapers and Hot Spots* (Invited talk), Gordon Research Conference "Plasmonics – optics at the nanoscale" in Keene State College, Keene, NH, USA, July 23-28, 2006.
119. *Nanolocalized Ultrafast Processes under Coherent Control* (Invited talk) 15th International Conference on Ultrafast Phenomena, Asilomar Conference Grounds, Pacific Grove, California, USA, July 31 - August 4 2006
120. *Theory and Modeling of Ultrafast Photoprocesses and Coherent Control in Metal Nanoplasmonics* (Invited Talk), Optics & Photonics 2006 SPIE Annual Meeting, 13-17 August 2006, San Diego, California USA.
121. *Nanoplasmonics* (Invited Short Course), Optics & Photonics 2006 SPIE Annual Meeting, 13-17 August 2006, San Diego, California USA.
122. *Nonlinear Processes in Nanoplasmonics* (Invited talk), Nonlinear Dynamics of Nanosystems, 28th-30th of August in Chemnitz, Germany
123. *Nanoplasmonics: Generation and Control of Nanoscale Optical Fields* (Invited talk) International Workshop "Plasmonics and Applications for Nanotechnologies" in Singapore; 5-7 December 2006.
124. *Causality and Negative Refraction* (Invited talk), International Workshop "Plasmonics and Applications for Nanotechnologies" in Singapore; 5-7 December 2006.
125. *Plasmonic Enhancing Nanoantennas for Photodetection* (Prabath Hewageegana and Mark I. Stockman, Invited talk), International Conference on Quantum Well Infrared Photodetectors, June 21-24, 2006, Sri Lanka.
126. *Nanolocalized Ultrafast Processes under Coherent Control*, 15th International Conference on Ultrafast Phenomena, Asilomar Conference Grounds, Pacific Grove, California, USA, July 31 - August 4 2006.
127. *Extreme Nanoplasmonics*, Optics & Photonics 2006 SPIE Annual Meeting, 13-17 August 2006, San Diego, California USA.
128. *Ultrafast, Nonlinear, and Active Nanoplasmonics*, 2005 Workshop of the Center of Excellence for the 21st Century (COE21) (Invited Talk), Tokyo, Japan, October 1-2, 2005.
129. *Coherent, Nonlinear, and Active Nanoplasmonics*, (Invited Talk), M. I. Stockman and D. J. Bergman, Progress In Electromagnetics Research Symposium 2005, Hangzhou, China, August 22-26, Abstracts, p. 230 (Electromagnetics Academy, Boston, 2005).
130. *Nano-Concentration of Optical Energy in Graded Nanoplasmonic Waveguides* (Invited Talk), M. I. Stockman, Progress In Electromagnetics Research Symposium 2005, Hangzhou, China, August 22-26, Abstracts, p. 109 (Electromagnetics Academy, Boston, 2005).

131. *Coherent, Nonlinear, and Active Nanoplasmonics* (Invited Talk), M. I. Stockman, IEEE AP-S International Symposium and USNC/URSI National Radio Science Meeting 2005, Washington, DC, July 3-8, 2005 *Ultrafast Nonlinear Photoprocesses in Nanoplasmonics*, M. I. Stockman, 2006 Conference on Ultrafast Optics V and Applications of High Field and Short Wavelength Sources XI, , Nara, Japan, September 25-30, 2005.
132. *Coherent, Nonlinear, and Active Nanoplasmonics* (Invited Talk), M. I. Stockman, IEEE AP-S International Symposium and USNC/URSI National Radio Science Meeting 2005, Washington, DC, July 3-8, 2005.
133. *Coherent, Nonlinear, and Active Nanoplasmonics* (Invited Talk), M. I. Stockman, Workshop DFG-SPP: Electrodynamic Metamaterials, Bad Honnef, Germany, June 27, 2005.
134. *Adiabatic Energy Concentration in Graded Nanoplasmonic Waveguides*, M. I. Stockman, CLEO/QELS 2005, Baltimore, MD, May 22-27, Talk **QMK2**.
135. *Ultrafast Processes in Nanoplasmonics* (Invited Talk), Workshop on Attosecond Science: Future Applications in Physics and Chemistry, ITAMP, Harvard University, May 1-4, 2005.
136. *Semiconductor Quantum Dots in Metal Nanostructures* (Invited talk), 2005 APS March Meeting, Los Angeles, CA, 2005.
137. *Theory of Nanoplasmonics: Optical Properties of Plasmonic Nanosystems* (Invited Lecture Course), Winter College *Optics and Photonics in Nanoscience and Nanotechnology*, The Abdus Salam International Center for Theoretical Physics, Trieste, Italy, 7-18 February, 2005.
138. *Coherent, Nonlinear, and Active Nanoplasmonics* (Invited Talk), 8th French-European/Israeli Conference on Nonlinear Optics (FRISNO8), Ein Bokek, Israel, February 20-25, 2005
139. *Coherent, Nonlinear, and Active Nanoplasmonics* (Invited Talk), 35th Winter Conference Physics of Quantum Electronics, Snowbird, UT, January 2-9, 2005.
140. *Computational Nanophotonics* (Invited paper), DOE Contractors Meeting *Condensed Phase and Interfacial Molecular Science*, October 24–27, 2004, Airlie Conference Center, Warrenton, VA.
141. *Surface Plasmon Lasers and Ultrafast Nonlinear Nanoplasmonic Effects* (Invited Talk), M. I. Stockman, OSA Frontiers in Optics Meeting, Rochester, New York, 10-14 October 2004, Paper #FThS4.
142. *Coherent, Nonlinear, and Active Nanoplasmonics* (Invited Talk), DOE Contractors Meeting *Atomic, Molecular and Optical Sciences*, September 12-15, 2004, Airlie Conference Center, Warrenton, VA
143. *Plasmon Laser*, (Invited Talk), M. I. Stockman, International Conference on Quantum Electronics and Photonics (Photon04), 6-9 September 2004, Glasgow, Great Britain.
144. *Nanophotonics in Metal-Semiconductor Nanostructures: Spaser and Other Phenomena* (Invited Talk), M. I. Stockman, Colorado Meeting on Fundamental Optical Properties of Semiconductors (FOPS), August 8–13, 2004 at the Stanley Hotel in Estes Park, Colorado.
145. *An Efficient Nanolens: Self-Similar Chain of Metal Nanospheres*, M. I. Stockman, K. Li, and D. J. Bergman, Optical Science and Technology (2004 SPIE Annual Meeting), 2-6 August 2004, Denver, Colorado, Paper #[5512-20].
146. *Delivering Energy to Nanoscale: Rapid Adiabatic Transformation, Concentration, and Stopping of Radiation in Nano-Optics* (Invited Paper), M. I. Stockman, Optical Science and Technology (2004 SPIE Annual Meeting), 2-6 August 2004, Denver, Colorado, Paper #[5512-05].

147. *Enhanced Second Harmonic Generation by Nanorough Surfaces: Nanoscale Depolarization, Dephasing, and Correlations* (Invited Paper), M. I. Stockman, D. J. Bergman, S. Brasselet, and J. Zyss, Optical Science and Technology (2004 SPIE Annual Meeting), 2-6 August 2004, Denver, Colorado, Paper # [5508-29].
148. *Coherent Control of Ultrafast Linear and Nonlinear Phenomena in Nanostructures*, M. I. Stockman, D. J. Bergman, and T. Kobayashi, International Conference on Ultrafast Phenomena, Niigata, Japan, July 25-30, 2004, Paper # TuC6.
149. *Enhanced, Ultrafast, and Stimulated Processes In Nanophotonics* (Invited Talk), M. I. Stockman, International Conference on Cooperative Phenomena in Optics and Transports in Nanostructures (CoPhen04) at Dresden (Germany), June 10-16, 2004.
150. *An Efficient Nanolens: Self-Similar Chain of Metal Nanospheres*, Mark I. Stockman, Kuiru Li, David J. Bergman, APS 2004 March Meeting, Montreal, Canada, March 22-26, 2004, Talk # DP34.002.
151. *Dipolar Emitters in Nanoscale Proximity of Metal Surface: Giant Enhancement of Relaxation* (Ivan Larkin, Mark Stockman, Marc Achermann, and Victor Klimov), APS 2004 March Meeting, Montreal, Canada, March 22-26, 2004, Talk # J36.013.
152. *Self-Similar Chain of Metal Nanospheres: Efficient Nanolens and Spaser* (M. I. Stockman, D.J. Bergman, K. Li, and X. Li) (Invited Talk), Progress in Electromagnetic Research Symposium (PIERS) 2004, Pisa, Italy, March 28-31, 2004.
153. *Localized Eigenstates of the Electromagnetic Field: Beyond The Quasi-Static Regime* (D. J. Bergman, K. Li, X. Li; M.I. Stockman) (Invited Talk), Progress in Electromagnetic Research Symposium (PIERS) 2004, Pisa, Italy, March 28-31, 2004.
154. *Excitons and Surface Plasmons in Metal-Semiconductor Nanosystems: SPASER and other Phenomena* (Invited Talk), (Mark I. Stockman), Photonic, Excitonic, and Spintronic Processes in Nanostructures, Dallas, Texas, January 22-24, 2004.
155. *Metal/Semiconductor Nanosystems: Spaser and other Phenomena* (Invited Talk), (Mark I. Stockman), The 34th Winter Conference on the Physics of Quantum Electronics, Snowbird, Utah, January 4-8, 2004.
156. *Nano-Localized Surface Plasmon States Near a Metallic Cluster* (Invited Talk) (David J. Bergman and Mark I. Stockman), Progress in Electromagnetics Research Symposium 2003 (PIERS2003), Honolulu, Hawaii, October 13-16, 2003.
157. *Quantum Nanoplasmonics: Surface Plasmon Amplification by Stimulated Emission of Radiation (SPASER) and Other Phenomena* (Invited Talk) (Mark I. Stockman and David J. Bergman), Progress in Electromagnetics Research Symposium 2003 (PIERS2003), Honolulu, Hawaii, 13-16 October, 2003.
158. *Surface Plasmon Amplification through Stimulated Emission of Radiation (SPASER)* (Mark I. Stockman and David J. Bergman), paper [5218-12], Optical Science and Technology (2003 SPIE Annual Meeting), San Diego, California, 3–8 August 2003. In: Complex Mediums IV: Beyond Linear Isotropic Dielectrics (Martin W. McCall, Graeme Dewar; Eds.), *Proceedings of SPIE* Vol. **5218**, pp. 93-102 (2003).
159. *Coherent Control of Ultrafast Nanoscale Localization of Optical Excitation Energy* (Invited Paper) (Mark I. Stockman, David J. Bergman, and Takayoshi Kobayashi), paper [5221-34], Optical Science and Technology (2003 SPIE Annual Meeting), San Diego, California, 3–8 August 2003. In: Plasmonics: Metallic Nanostructures and Their Optical Properties (Naomi J. Halas, Ed.), *Proceedings of SPIE* Vol. **5221**, pp. 182-196 (2003).
160. *Ultrafast Nanoscale Optical Fields: Spaser and Other Phenomena* (Invited Talk) (Mark I. Stockman), Gordon Research Conference "Nonlinear Optics and Lasers, July 27 - August 1, 2003, Colby-Sawyer College, New London, NH.
161. *Ultrafast Nanoplasmonics: Surface Plasmon Amplification by Stimulated Emission of Radiation (SPASER*) (Mark I. Stockman and David J. Bergman), Ultrafast Optics IV, June 29 - July 3, 2003, Vienna, Austria.

162. *Coherent control of nanoscale localization of ultrafast optical excitation in nanostructures*, (David J. Bergman, Mark I. Stockman and Takayoshi Kobayashi), Ultrafast Optics IV, June 29 - July 3, 2003, Vienna, Austria.

163. *Quantum Nanoplasmonics: Surface Plasmon Amplification by Stimulated Emission of Radiation (SPASER)* (Mark I. Stockman and David J. Bergman), QELS 2003 (Baltimore, Maryland June 1-6, 2003), Postdeadline Papers Book, Talk #QThPDA10, OSA (2003).

164. *Near-Field Phase-Sensitive Spectroscopy of Metal Nanoassemblies* (Alexander Mikhailovsky, Melissa Petruska, Mark I. Stockman, Andrew Bartko, Marc Achermann, Mark Stockman, and Victor Klimov), QELS 2003 (Baltimore, Maryland June 1-6, 2003), Technical Digest, Talk #QtuA2, OSA (2003).

165. *Coherent Control of Nanoscale Localization of Ultrafast Optical Excitation in Nanostructures* (Mark I. Stockman, David J. Bergman, and Takayoshi Kobayashi), QELS 2003 (Baltimore, Maryland June 1-6, 2003), Technical Digest, Talk #QMJ4, OSA (2003).

166. *Coherent Control of Linear and Nonlinear Ultrafast Optical Excitation of Nanosystems* (David J. Bergman, Takayoshi Kobayashi, and Mark I. Stockman) APS March 2003 Meeting (Austin, Texas, March 3-7, 2003), Bulletin of American Physical Soc. **48**, 1060 (2003).

167. *Quantum Nanoplasmonics: Surface Plasmon Amplification through Stimulated Emission of Radiation (Spaser)* (Mark I. Stockman and David J. Bergman), APS March 2003 Meeting (Austin, Texas, March 3-7, 2003), Bulletin of American Physical Soc. **48**, 976 (2003).

168. *Near-Field Interference Spectroscopy of Individual Metal Nanostructures* (Alexander Mikhailovsky, Melissa Petruska, Andrew Bartko, Marc Achermann, Mark Stockman, and Victor Klimov), APS March 2003 Meeting (Austin, Texas, March 3-7, 2003), Bulletin of American Physical Soc. **48**, 852 (2003).

169. *Ultrafast Processes in Metal-Insulator and Metal-Semiconductor Nanocomposites* (Mark I. Stockman), Photonics West 2003 Conference, SPIE, January 25-31, 2003 (Invited talk). Proceedings of SPIE Vol. **4992**, 60-74 (2003) (K. F. Tsen, J. Song, and H. Jiang, eds.).

170. *Femtosecond Energy Concentration in Nanosystems: Coherent Control*, (Mark I. Stockman, Sergey V. Faleev, and David J. Bergman), 6-th International Conference on Electronic Transport and Optical Properties of Inhomogeneous Media (ETOPIM-6) Abstracts, Salt Lake City, Utah, 14-19 July, 2002, p. 160 (University of Utah, 2002).

171. *Femtosecond Energy Concentration in Nanosystems Controlled by Excitation Phase*, (Mark I. Stockman, Sergey V. Faleev, and David J. Bergman), Proceedings of the Progress in Electromagnetics Research Symposium 2002 (PIERS 2002) (July 1 - 5, 2002, Cambridge, Massachusetts, USA), p. 842 (Invited Talk).

172. *Anderson Localization vs. Delocalization of Surface Plasmons in Nanosystems* (David J. Bergman, Mark I. Stockman, and Sergey V. Faleev), Proceedings of the Progress in Electromagnetics Research Symposium 2002 (PIERS 2002) (July 1 - 5, 2002, Cambridge, Massachusetts, USA), p. 841 (Invited Talk).

173. *Anderson Localization vs. Delocalization of Surface Plasmons in Nanosystems* (David J. Bergman, Mark I. Stockman, and Sergey V. Faleev), QELS 2002 (Long Beach, CA, May 19-24, 2002), Talk QF86, QELS 2002 Technical Digest, pp. 259-260, OSA, 2002.

174. *Femtosecond Energy Concentration in Nanosystems Coherently Controlled by Excitation Phase* (Mark I. Stockman, Sergey V. Faleev, and David J. Bergman), The Thirteenth International Conference on Ultrafast Phenomena (Vancouver, BC, Canada, May 12-17, 2002), Talk ME41-1, Technical Digest, pp. 135-136, OSA, 2002.

175. *Femtosecond Energy Concentration in Nanosystems Coherently Controlled by Excitation Phase Modulation* (Mark I. Stockman, Sergey V. Faleev, and David J.

Bergman), In: Technical Proceedings of the Second International Conference on Computational Nanoscience and Nanotechnology (NanoTech 2002 - ICCN 2002), pp. 380-382 (Computational Publications, Boston, Geneva, San Francisco, 2002).

176. *Anderson Localization vs. Delocalization of Surface Plasmons in Nanosystems* (David J. Bergman, Mark I. Stockman, and Sergey V. Faleev), APS March 2002 Meeting (Indianapolis, Indiana, March 18-22, 2002), Bulletin of American Physical Soc. **47**, 1265 (2002).
177. *Self-Consistent Random-Phase Approximation for Interacting Electrons in Quantum Wells and Intersubband Absorption* (Sergey V. Faleev and Mark I. Stockman), APS March 2002 Meeting (Indianapolis, Indiana, March 18-22, 2002), Bulletin of American Physical Soc. **47**, 1189 (2002).
178. *Femtosecond Energy Localization on Nanoscale Controlled by Pulse Phase* (Mark I. Stockman, Sergey V. Faleev, and David J. Bergman, APS March 2002 Meeting (Indianapolis, Indiana, March 18-22, 2002), Bulletin of American Physical Soc. **47**, 734 (2002).
179. *Experimental and Many-Body Theoretical Investigations of Intersubband Far Infrared Absorption in Quantum Well Photodetectors* (Mark I. Stockman, Sergey V. Faleev, Steven G. Matsik, A. G. Unil Perera, and H. C. Liu), APS March 2002 Meeting (Indianapolis, Indiana, March 18-22, 2002), Bulletin of American Physical Soc. **47**, 59 (2002).
180. *Self-Consistent RPA for two-Dimensional Electron Gas: Kadanoff-Baym-Keldysh Approach* (S. V. Faleev and M. I. Stockman), APS March 2001 Meeting, Bulletin of American Physical Soc., **46**(1), 1147 (2001).
181. *Ultrafast Laser-Induced Processes in Nanostructured Materials*, APS March 2001 Meeting, Bulletin of American Physical Soc., **46**(1), 687 (2001).
182. *Coherently-Controlled Femtosecond Energy Localization on Nanoscale* (M. I. Stockman, S. V. Faleev, and D. J. Bergman), Gordon Research Conference *"Nonlinear Optics and Lasers",* Colby-Sawyer College, New London, NH, 2001.
183. *Coherently-Controlled Femtosecond Energy Localization on Nanoscale* (M. I. Stockman, S. V. Faleev, and D. J. Bergman), Ultrafast Optics 2001 Conference, Montebello, Quebec, Canada, 2001, Abstracts (NRC-CNRC, Ottawa, Ontario, Canada, 2001), pp. 227-231.
184. *Ultrafast Laser-Induced Processes in Nanostructured Systems,* Eleventh Conference on Computational Research on Materials, Morgantown, West Virginia, 2001.
185. *Ultrafast Processes in Clusters and Nanocomposites,* Tenth Conference on Computational Research on Materials, Morgantown, West Virginia, 2000 (Invited talk).
186. *Femtosecond and Attosecond Giant Optical Responses and Fluctuations in Disordered Clusters, Nanocomposites and Rough Surfaces*, The Twelfth International Conference on Ultrafast Phenomena, Charleston, South Carolina, July 9-13, 2000 (Optical Society of America). Published in Technical Digest, pp. 318-320.
187. *Chaos of Excitations, Giant Fluctuations, and Nonlinear Optical Enhancement in Large Clusters and Nanocomposites*, Progress in Electromagnetics Research Symposium, Cambridge, Massachusetts, 5-14 July 2000 (PIERS 2000) (Invited Talk). Published in PIERS 2000 Proceedings (The Electromagnetics Academy, Cambridge, MA, 2000), p. 1006.
188. *Quantum Chaos and Correlation of Currents in Oscillator in Magnetic Field (A Model for a Quantum Dot with Soft Confining Potential)*, Ninth Conference on Computational Research on Materials, Morgantown, West Virginia, May 18-21, 1999 (Invited Talk).
189. *Nonlinear Optical Susceptibilities of Composites*, 1999 APS March Meeting, Atlanta, Georgia (1999) (M. I. Stockman and K. B. Kurlayev). Bull Amer. Phys. Soc. **44**(1), part II, 1055 (1999).

190. *Chaos and Turbulence of Quantum Currents for Nonlinear Oscillator in Magnetic Field*, 1999 APS March Meeting, Atlanta, Georgia (1999) (J. R. Evans and M. I. Stockman). Bull Amer. Phys. Soc. **44**(1), part II, 1789 (1999).

191. *Theory of Photon Drug Effect in Quantum Wells Based on Baym-Kadanoff-Keldysh Approach*, 1999 APS March Meeting, Atlanta, Georgia (1999) (M. I. Stockman and S. V. Faleev). Bull Amer. Phys. Soc. **44**(1), part II, 1900 (1999).

192. *Manifestations of Quantum Chaos in Nonlinear Optical Properties of Composites*, Eighth Conference on Computational Research on Materials, Morgantown, West Virginia, May 20-22, 1998 (Invited Talk).

193. *Chaos in Dipolar Eigenproblems*, 1998 APS March Meeting, Los Angeles, California, 1998. Bulletin of the American Physical Society (1998).

194. *Mesoscopic Computational Investigation of Optical Properties of Cluster Composites*, Seventh Conference on Computational Research on Materials, Morgantown, West Virginia, May 14-16, 1997 (Invited Talk).

195. *Singularities and Scaling of Optical Responses in Cluster Composites*, APS 1997 Spring Meeting, Kansas City, Missouri, 1997. Bulletin of the American Physical Society, **42**(1), 132 (1997).

196. *Nonlinear Photoprocesses and Scaling and Singularities of Local Fields in Nanocomposite Materials*, Third International Conference on Organic Nonlinear Optics (ICONO'3), Marco Island, Florida, December 16-20, 1996. University of Central Florida and CREOL, Orlando, Florida, 1996, p.195.

197. *Enhanced Nonlinear-Optical Responses of Disordered Clusters and Composites* (An Invited Lecture),Workshop *Mathematical Methods in Materials Science*, Institute for Mathematics and its Applications, University of Minnesota, Minneapolis, Minnesota, March 4-8, 1996. Bulletin of American Phys. Soc. **41**(1), 387 (1996).

198. *Inhomogeneous Localization and Enhanced Fluctuations and Responses in Disordered Clusters and Nanocomposites*, APS 1996 Spring Meeting, St. Louis, Missouri, 1996.

199. *Giant Fluctuations of Local Optical Fields in Fractal Clusters*, APS 1995 Spring Meeting, San Jose, California, 1995.

200. *Intersubband Optical Bistability in an Asymmetric Double Quantum Well*, APS 1995 Spring Meeting, San Jose, California, 1995.

201. *Giant Local-Field Fluctuations and Productions of Plasmas at Rough Surfaces by Femtosecond Pulses*, Optical Society of America Annual Meeting/Interdisciplinary Laser Science Conference-10 (Dallas, Texas, 1994), Bulletin of the American Physical Society, **39**, 1364 (1994) [Also in: Program and Abstracts of the 1994 Optical Society of America Annual Meeting/10-th Interdisciplinary Laser Science Conference (Paper #ThKK2)].

202. *Absorption Saturation Study of Landau Levels in Quasi-Two-Dimensional Systems*, Seventh International Conference on Superlattices, Microstructures and Microdevices, Banff, Alberta, Canada, 1994.

203. *Optics of Fractals*, Conference on Emerging Issues in Mathematics and Computation from the Materials Science, Pittsburgh, PA, 1994.

204. *Subband-Landau-Level Relaxation in Single and Coupled-Double Quantum-Well Structures*, Sixth International Conference on Modulated Semiconductor Structures, Garmish-Partenkirchen, Germany, 1993.

205. *Saturation Spectroscopy of Hot Carriers in Coupled-Double Quantum-Well Structures*, Eighth International Conference on Hot Carriers in Semiconductors, Oxford, England, 1993.

206. *Light-Induced Drift of Electrons in Double Quantum Wells*, 1993 March Meeting of American Physical Society, Seattle, Washington, Bull. Am. Phys. Soc. **38** (1), 592 (1993).

207. *Light-Induced Counter-Field Electron Transfer in Asymmetric Double Quantum Wells,* 1993 March Meeting of American Physical Society, Seattle, Washington, Bull. Am. Phys. Soc. **38** (1), 592 (1993).

208. *Scaling and Enhanced Raman Scattering from Fractal Clusters,* 1993 March Meeting of American Physical Society, Bull. Am. Phys. Soc. **38** (1), 62 (1993).

209. *Optical Responses of Fractal Media,* International Conference *Progress in Nonlinear Optics: Organic and Polymeric Materials,* Washington State University, Pullman, Washington, July 16-17, 1992.

210. *Photoinduced Electron Transfer Counter to the Bias Field in Coupled Quantum Wells,* Materials Research Society Spring Meeting, San Francisco, California, 1992.

211. *Theoretical Studies of (1) Semiconductor Heterostructures and (2) Silicon Clusters and Metallic Fractal Clusters,* Office of Naval Research Solid-State and Surface Chemistry Program Contractors Meeting, Arlington, Virginia, 1991.

212. *Scale-Invariant Theory of Optical Properties of Fractal Clusters,* Materials Research Society 1990 Fall Meeting, Boston, Massachusetts.

213. *Monte-Carlo Simulation of Polarization-Selective Spectral Hole Burning in Fractal Clusters,* Materials Research Society 1990 Fall Meeting, Boston, Massachusetts.

214. *Theory and Numerical Simulation of Optical Properties of Fractal Clusters.* First Canadian Conference on Computational Chemistry, Quebec, Canada, 1991 (Invited Talk).

215. *Scale-Invariant Theory of Optical Properties of Fractals,* Vavilov Conference on Nonlinear Optics, USSR Academy of Sciences, Novosibirsk, Russia, 1990.

216. *Nonlinear Optics of Metallic Fractal Clusters: Giant Nonlinearities and Optical Information Recording,* in: *Abstracts of the Sixth Interdisciplinary Laser Science Conference (ILS-VI),* Minneapolis, Minnesota, 1990, Bull. Am. Phys. Soc. **35** (7), 1513 (1990).

217. *Laser Nanomodification of Surfaces and Superdense Optical Memory,* International Workshop on the Optical Information Processing, Novosibirsk, Russia, 1989.

218. *Giant Optical Nonlinearities of Fractal Clusters,* Second European Conference on Quantum Electronics, Dresden, 1989, Europhysical Conference Abstracts, **13D**, Part 1, #I16 (1989).

219. *Optics of Fractals,* International School on Laser Applications, Sayanogorsk, Russia, 1989.

220. *Nanomodification of Surfaces and Macromolecules,* International School on Laser Applications, Sayanogorsk, Russia, 1989.

221. *Fractal Clusters and Light-Scattering from Biological Objects,* Second International Conference on Laser Scattering Spectroscopy of Biological Objects, Book of Summaries, Pecs, Hungary, Janus Pannonius University, pp. 41-42 (1988).

222. *Nonlinear Optics of Metallic Fractal Clusters,* Abstracts of the 13-th International Conference on Coherent and Nonlinear Optics, Minsk, USSR, p.141-142 (1988).

223. *Site-Specific Laser Photomodification of Macromolecules and Surfaces,* 13-th International Conference on Coherent and Nonlinear Optics, Minsk, USSR (1988).

12. Selected Invited Colloquium Talks

1. *Attosecond Phenomena in Solids,* Extreme Photonics Colloquium, University of Ottawa, Canada, Wednesday, January 21, 2015.
2. *Solids in Ultrafast and Strong Fields,* Colloquium of the Department of Physics, Boston University, Boston, MA, October 5, 2012.

3. *Spaser and Gain Nanoplasmonics,* Colloquium of the Department of Physics, King's College, London, UK, June 21, 2012.
4. *Nanoplasmonics: Linear, Nonlinear, and Quantum,* Zhong-Guan-Cun Forum on Condensed Matter Physics – the 232th Lecture at Beijing Institute of Physics, Chinese Academy of Sciences, Beijing, November 23, 2011.
5. *Nanoplasmonics: The Physics behind the Applications,* Colloquium at the Italian Institute of Technology, June 28, 2011.
6. *Nanoplasmonics: Smaller, Stronger, Faster!,* Colloquium at the Mechanical Engineering Division, Korean Advanced Institute of Science and Technology, Daejeon, S. Korea, May 12, 2011.
7. *Nanoplasmonics: The Physics behind the Applications,* Colloquium of the Department of Physics and Astronomy, University of Central California, 15 April, 2011, Los Angeles, CA, USA.
8. *Nanoplasmonics: The Physics behind the Applications,* Center for Revolutionary Solar Photoconversion (CRSP) Seminar at the University of Colorado, 14 April 2011, Boulder, CO, USA.
9. *Nanoplasmonics: Citius, Minimius, Fortius!*. Science at the Edge Seminar, Michigan State University, East Lansing. MI, January 14, 2011.
10. *Metallization of Dielectric Nanofilms in Strong Adiabatic Fields,* Special Seminar at the Max Plank Institute for Quantum Optics (MPQ), Garching, Germany, November 17, 2010.
11. *Nanoplasmonics: Smaller, Stronger, Faster!,* Colloquium of the Department of Physics and Center for Materials Research, Norfolk State University, Norfolk, VA, November 12, 2010.
12. *Nanoplasmonics: Smaller, Stronger, Faster!,* Colloquium at Institute of Electronics Materials Technology, Warsaw, Poland, November 5, 2010.
13. *Nanoplasmonics: The Physics behind Applications,* Colloquium at Institute of Electronics Materials Technology, Warsaw, Poland, November 4, 2010.
14. *Nanoplasmonics: Smaller, Stronger, Faster!* Seminar of the Institute of Physics, Wroclaw Polytechnic University, Wroclaw, Poland, November 2, 2010.
15. *Nanoplasmonics: Phenomena and Applications,* Applied Physics Colloquium, School of Engineering and Applied Science, Harvard University, March 12, 2010
16. *Nanoplasmonics: Phenomena and Applications,* Samsung Advanced Institute of (SAIT), S. Korea (February 23, 2010).
17. *Nanoplasmonics: Applications and Phenomena,* Colloquium of the Department of Electrical Engineering, University of Michigan, Ann Arbor, MI, January 20, 2010.
18. *Present and Future Trends of Nanoplasmonics,* Colloquium of the Department of Physics, University of Michigan, Ann Arbor, MI, January 19, 2010.
19. *New Horizons of Nanoplasmonics: From SPASER to Attoseconds,* Seminar of Condensed Matter Physics, Tel Aviv University, December 24, 2009.
20. *New Horizons of Nanoplasmonics: From SPASER to Attoseconds,* Colloquium of the Department of Physics, Taiwan National University, Taipei, Taiwan, December 19, 2009.
21. *New Horizons of Nanoplasmonics: From SPASER to Attoseconds,* University of Colorado at Boulder Physics Colloquium, November 4, 2009.
22. *SPIDER (Surface-Plasmon-Induced Drag-Effect Rectification),* Italian Institute of Technology, Genoa (Italy), October 26, 2009.
23. *New Horizons of Nanoplasmonics: From SPASER to Attoseconds,* University of Georgia at Athens Physics Colloquium, September 10, 2009.
24. *New Horizons of Nanoplasmonics: From SPASER to Attoseconds,* Texas A&M University Physics Colloquium, September 3, 2009.
25. *New Horizons of Nanoplasmonics: From Attoseconds to Terahertz,* SFB 613 Seminar, University of Bielefeld, Germany, Monday, May 11,2009, 4-5 pm.

26. *New Horizons of Nanoplasmonics: From Attoseconds to Terahertz,* Colloquium at University of Vigo, Spain, Department of Chemistry, Monday, April 27, 2009, 12:30-1:30 pm.*New Horizons of Nanoplasmonic,* Colloquium of Max Plank Institute for Quantum Optics (MPQ), Garching, Germany, Wednesday, March 11, 2009, 3:40-4:10 pm.
28. *Plasmonics: From Attoseconds to Terahertz,* University of Southampton, UK, December 10, 2008.
29. *Fundamentals and Applications of Nanoplasmonics,* University Magna Grecia, Catanzaro, Italy, November 19, 2008.
30. *Fundamentals and Applications of Nanoplasmonics,* Fresnel Institute, Marseille, France, October 15, 2008.
31. *Trends in Nanoplasmonics,* Institut d'Alembert, l'Ecole Normale Supérieure de Cachan, France, July 2008.
32. *Ultrafast and Quantum Nanoplasmonics,* l'Ecole Supérieure de Physique et de Chimie Industrielles de la ville de Paris (ESPCI), France, June 17, 2008.
33. *Ultrafast and Quantum Nanoplasmonics,* ICFO - Institute of Photonic Sciences, Castelldefels (Barcelona) Spain, May 15, 2008.
34. *Ultrafast and Quantum Nanoplasmonics,* Instituto de Optica – CSIC, Madrid, Spain.
35. *Ultrafast and Quantum Nanoplasmonics,* Department of Physics, University of Texas at Austin, May 1, 2008.
36. *Ultrafast and Quantum Nanoplasmonics,* Korea National University, Seoul, S. Korea, February 25, 2008.
37. *Ultrafast and Quantum Nanoplasmonics,* Seoul National University, Seoul, S. Korea, February 26, 2008.
38. *Coherent, Nonlinear, and Ultrafast Nanoplasmonics,* Physics Department, Queens College CUNY, December 10, 2007.
39. *Nanoplasmonics: Phenomena and Applications,* Chemistry Division Colloquium, Argonne National Laboratory, December 3, 2007.
40. *Nanoplasmonics: Generation and Control of Nanoscale Optical Fields*, Monthly Seminar of the Russell Berry Nanotechnology Institute, Technion City (Haifa, Israel), November 28, 2007.
41. *Nanoplasmonics: Generation and Control of Nanoscale Optical Fields*, Weizmann Institute of Technology (Rehovot, Israel), November 21, 2007.
42. *Nanoplasmonics: Generation and Control of Nanoscale Optical Fields*, Bar Ilan University (Tel Aviv, Israel), November 20, 2007.
43. *Fundamentals and Applications of Nanoplasmonics,* Colloquium of the Materials Science and Engineering Program, Tel Aviv University, (Tel Aviv, Israel), November 20, 2007.
44. *Nanoplasmonics under Coherent Control*, Colloquium of the Department of Physics, Tel Aviv University, (Tel Aviv, Israel) November 18, 2007.
45. *Nanoplasmonics: Generation and Control of Nanoscale Optical Fields*, Stevens Institute of Technology, Hoboken (NJ, USA), February 28, 2007
46. *Ultrafast Nanoplasmonics,* Colloquium of the Max Plank Institute for Quantum Optics, Garching at Munich, Germany, February 2007
47. *Nanoplasmonics,* Colloquium at the Department of Physics, National Taiwan University, Taipei, December 19, 2007.
48. *Nanoplasmonics: Generation and Control of Nanoscale Optical Fields,* Colloquium at Ecole Normale Supérieure de Cachan (France), March 17, 2006.
49. *Nanoplasmonics: Generation and Control of Nanoscale Optical Fields*, Colloquium of the Department of Electrical Engineering at Columbia University, May 1, 2006.
50. *Nonlinear Nanoplasmonics and Coherent Control on Nanoscale,* Colloquium of Department of Electrical Engineering, University of California at San Diego, August 18, 2006.

51. *Coherent, Nonlinear, and Ultrafast Nanoplasmonics*, Colloquium of the Department of Physics, National Taiwan University, December 12, 2006.
52. *Nanoplasmonics and its Applications*, Chemistry Division, Los Alamos National Laboratory, November 9, 2005.
53. *Coherent, Nonlinear, and Active Nanoplasmonics*, Sonderseminar des Centrums für Angewandte Photonik – CAP, University of Konstanz, Germany, June 29, 2005.
54. *Coherent, Nonlinear, and Active Nanoplasmonics*, Institut für Angewandte Physik /Photophysik, Technische Universität Dresden, Germany, July 26, 2005.
55. *Coherent, Nonlinear, and Active Nanoplasmonics*, Optics Seminar, University of North Carolina at Charlotte, Friday, March 4, 2005.
56. *Coherent, Nonlinear, and Active Nanoplasmonics (Nanolocalization of Optical Energy)*, Colloquium of Nanoscience Program, University of Pittsburgh, January 21, 2005.
57. *Coherent, Nonlinear, and Active Nanoplasmonics*, Colloquium at the Department of Chemical Physics, Weizmann Institute of Sciences, Rehovot, Israel, December 28, 2004.
58. *Coherent, Nonlinear, and Active Nanoplasmonics*, Colloquium at the Department of Electrical Engineering, Technion – Israel Institute of Technology, Technion City, Haifa, Israel, December 28, 2004.
59. *Coherent, Nonlinear, and Active Nanoplasmonics*, Colloquium at the Department of Physics, Tel Aviv University, Tel Aviv, Israel, 18 December, 2004.
60. *Coherent, Nonlinear, and Active Nanoplasmonics*, Colloquium of the Department of Computer Engineering at University of Illinois at Urbana-Champaign, December 2-3, 2004.
61. *Coherent, Nonlinear, and Active Nanoplasmonics*, Rice University, Houston, TX, October 21-22, Colloquium of the Nanoscience Program.
62. *Plasmonic Laser (Coherent, Ultrafast, and Nonlinear Nanoplasmonics)*, Seminar of the Nanophotonics Centre of the University of Southampton, UK, 2.00 pm, 9 September 2004.
63. *Coherent, Ultrafast, and Nonlinear Nanoplasmonics*, Colloquium of the Department of Physics, Imperial College, London, UK, September 6, 2004.
64. *Nanophotonics: Ideas and Phenomena*, Colloquium of the Steacie Institute for Molecular Sciences, NRC, Ottawa, Canada, August 19, 2004.
65. *Nanophotonics: Ideas and Phenomena*, Oberseminar der Sektion Physik und der Center for Nanoscience, Ludwig Maximilan University, Munich, Germany, 25 June 25, 2004.
66. *Nanophotonics: Ideas and Phenomena*, Colloquium Ehrenfestii, University of Leiden, The Netherlands, June 9, 2004.
67. *Nanophotonics: Ideas and Phenomena*, Institute for Physics and Nanotechnology, Aalborg University, Denmark, June 2, 2004.
68. *Enhanced, Ultrafast, Coherent, and Active Nanoplasmonics*, Colloquium of the Theoretical Department of Los Alamos National Laboratory, May 26, 2004.
69. *Plasmonic Nanophotonics*, Colloquium of the Department of Chemistry, University of Rochester, Rochester, NY, March 1, 2004.
70. *Nanophotonics: Ideas and Phenomena*, MRSEC Seminar, The James Franck Institute and The Materials Research Center, University of Chicago, Chicago, IL, February 10, 2004.
71. *Nanophotonics: Ideas and Phenomena*, Biomolecular Nanotechnology Seminar, Department of Physics and Astronomy, Arizona State University, Tempe, AZ, December 4, 2003.
72. *Nanofocusing and Generation in Nanooptics*, Colloquium of the Department of Chemistry, GaTech, Atlanta, Georgia, December 1, 2003.
73. *Novel Nanooptics*, Nanophysics Seminar, Department of Physics, Vanderbilt University, Nashville, Tennessee, October 31, 2003.
74. *Nanoscale Photoprocesses*, Colloquium at Illinois Institute of Technology, Chicago, Illinois, September 18, 2003.

75. *Novel Nanooptics*, Colloquium of the Department of Physics, University of Utah, Salt Lake City, Utah, September 11, 2003.
76. *Second Harmonic Generation on Nanostructured Surfaces*, Colloquium of Laboratory for Quantum and Molecular Photonics, École Normale Supérieure de Cachan, Paris, France, July 10, 2003.
77. *Ultrafast and Coherent Photoprocesses on Nanoscale*, Seminar of the Department of Polymer Science, University of Akron, Ohio, November 21, 2002.
78. *Ultrafast and Nonlinear Optical Processes in Nanosystems*, Colloquium of the Department of Physics, University of Wisconsin-Stevens Point (November 1, 2002).
79. *Ultrafast Laser-Induced Processes in Nanosystems*, Softmatter Nanotechnology and Advanced Spectroscopy Colloquium of the Chemistry Division, Los Alamos National Laboratory, Los Alamos, NM, June 13, 2002.
80. *Ultrafast Concentration and Transfer of Energy in Nanostructures: Optical Excitation and Control*, Center for Engineering Science Advanced Research and Computer Science and Mathematics Division Colloquium, Oak Ridge National Laboratory, Oak Ridge, TN, April 19, 2002.
81. *Ultrafast Processes in Nanosystems: "Ninth-Wave" Effect, Anderson Localization/Delocalization of Surface Plasmons, and Coherent Control of the Spatial Localization on Nanoscale*, Condensed Matter Seminar, Department of Physics, Georgia Tech, March 14, 2002.
82. *Ultrafast Processes in Nanosystems*, Colloquium of the Department of Physics, University of Georgia at Athens, October 4, 2001.
83. *Giant Fluctuations, Enhancement and Ultrafast Optical Responses in Disordered Clusters, Composites and Rough Surfaces*, Department of Physics, Emory University, Atlanta, Georgia, February 21, 2000.
84. *Femtosecond and Attosecond Chaos, Giant Fluctuations and Nonlinear Optical Enhancement in Disordered Clusters, Nanocomposites and Rough Surfaces*, Colloquium of the Department of Electrical Engineering, Washington University, Saint Louis, February 11, 2000.
85. *Femtosecond and Attosecond Chaos, Giant Fluctuations of Local Optical Fields and Nonlinear Optical Enhancement In Disordered Clusters, Nanocomposites and Rough Surfaces*, Colloquium of the Department of Physics, University of Toronto, Ontario, Canada, January 24, 2000.
86. *Femtosecond and Attosecond Chaos, Giant Fluctuations of Local Optical Fields and Nonlinear Optical Enhancement In Disordered Clusters, Nanocomposites and Rough Surfaces*, Colloquium of the Department of Physics, Georgia Tech, January19, 2000.
87. *Nonlinear Optical Enhancement and Eigenmode Chaos in Nanocomposites* Colloquium of the Department of Physics, University of Georgia at Athens, October 29, 1999.
88. *Nonlinear Optical Enhancement in Clusters and Nanocomposites*, Colloquium of the Department of Physics and Astronomy, Alabama State University, Tuscaloosa, Alabama, February 10, 1999.
89. *Field-Theoretical Approach to Light-Induced Drift (Photon-Drag) Effect in Semiconductor Quantum Wells*, University of Georgia, Athens, Georgia, October 10, 1998
90. *Enhanced Nonlinear Responses, Chaos, and Correlation of Eigenmodes in Large Disordered Clusters*, University of Georgia, Athens, Georgia, October 4, 1997
91. *Inhomogeneous Plasmon Localization, Chaos, and Correlations in Large Disordered Clusters*, Georgia State University, Atlanta, GA, 1997.
92. *Electron Dynamics and Nonlinear Optical Responses in Confined Systems (Heterostructures, Clusters And Composites)*, Georgia State University, Atlanta, Georgia, 1996.

93. *Fluctuations, Scaling, and Enhanced Nonlinear-Optical Processes in Fractals*, James Frank Institute, University of Chicago, Chicago, Illinois, 1993.
94. *New Photoinduced Electron-Transfer Effects in Semiconductor Quantum Wells*, Department of Physics and Astronomy, State University of New York at Buffalo, Amherst, New York, 1993.
95. *Enhanced Nonlinear Photoprocesses and Fluctuations in Fractal Media*, Institute of Optics, College of Engineering and Applied Science, University of Rochester, Rochester, New York, 1993.
96. *Enhanced Nonlinear Photoprocesses and Fluctuations in Fractal Media*, Department of Physics and Astronomy and Ames Laboratory, Iowa State University, Ames, Iowa, 1993.
97. *Enhanced Nonlinear Photoprocesses and Fluctuations in Fractal Media*, Department of Chemistry, University of Toronto, Toronto, Ontario, Canada, 1993.
98. *Concept of Multifractality in Physics*, Department of Pure and Applied Mathematics, Washington State University, Pullman, Washington, 1992.
99. *Surface-Enhanced Raman Scattering from Fractals: Scale-Invariant Theory*, Department of Physics, Washington State University, Pullman, Washington, 1992.
100. *Counter-Field Electron Transfer in Coupled Semiconductor Quantum Wells*, Department of Physics, Washington State University, Pullman, Washington, 1992.
101. *Optics of Fractals*, Department of Physics, University of Idaho, Moscow, Idaho, 1992.
102. *Fractal Clusters and Enhanced Optical Processes*, Department of Chemistry, Washington State University, Pullman, Washington, 1992.
103. *Theoretical Studies of (1) Semiconductor Heterostructures and (2) Silicon Clusters and Metallic Fractal Clusters*, Molecular Science Research Center, Battelle Pacific Northwest Laboratories, Richland, Washington, 1991.
104. *Light-Induced Drift of Electrons in Semiconductor Quantum Wells*, Department of Physics, Washington State University, Pullman, Washington, 1991.
105. *Nonlinear Optics of Fractals*, Department of Physics, University of Michigan, Ann Arbor, Michigan, 1990.
106. *Nonlinear Photoprocesses in Macromolecules*, Department of Physics and Astronomy, University of New Mexico, Albuquerque, New Mexico, 1990.
107. *Optical Properties of Fractal Structures*, Department of Chemistry, University of Washington, Seattle, Washington, 1990.
108. *Light-Induced Drift of Electrons in Semiconductor Quantum Wells*, Department of Physics and Astronomy, State University of New York at Buffalo, Buffalo, New York, 1990.

CURRICULUM VITAE

BRIAN D. THOMS

Positions Held:

Associate Chair, Department of Physics and Astronomy, Georgia State University, Atlanta, GA, 8/12 to present.
Associate Professor, Department of Physics and Astronomy, Georgia State University, Atlanta, GA, 9/01 to present.
Undergraduate Director, Department of Physics and Astronomy, Georgia State University, Atlanta, GA, 6/01 to present.
Assistant Professor, Department of Physics and Astronomy, Georgia State University, Atlanta, GA, 9/95 to 9/01.
Senior Scientist, Geo-Centers, Inc., Ft. Washington, MD, 11/94 to 8/95.
National Research Council Postdoctoral Research Associate, Gas/Surface Dynamics Section, Code 6174, Naval Research Laboratory, Washington, DC, 11/91 to 11/94.
Graduate Research Assistant, Department of Physics, Cornell University, Ithaca, NY, 5/85 to 11/91.
Graduate Teaching Assistant, Department of Physics, Cornell University, Ithaca, NY, 8/83 to 5/85.

Education:

Ph.D., Physics, 1992, Cornell University, Ithaca, New York.
M.S., Physics, 1987, Cornell University, Ithaca, New York.
B.S., Physics, 1983, University of Illinois at Urbana-Champaign.

Professional Memberships:

American Physical Society
American Association of Physics Teachers
Society of Physics Students
Sigma Pi Sigma

Journal Articles:

1. "A differentially pumped electron-energy-loss spectrometer with multichannel detector for time-resolved studies at intermediate ambient pressures," P. W. Lorraine, B. D. Thoms, and W. Ho, Review of Scientific Instruments **63**, 1652 (1992).

2. "Translationally and vibrationally activated reaction of CO_2 on Si(111)7x7," P. W. Lorraine, B. D. Thoms, R. A. Machonkin, and W. Ho, Journal of Chemical Physics **96**, 3285 (1992).

3. "A molecular beam study of ethane on Si(111)7x7: Energy accommodation and trapping," B. D. Thoms, P. W. Lorraine, and W. Ho, Journal of Chemical Physics **97**, 2759 (1992).

4. "A vibrational study of the adsorption and desorption of hydrogen on polycrystalline diamond," B. D. Thoms, P. E. Pehrsson, and J. E. Butler, Journal of Applied Physics **75**, 1804 (1994).

5. "Adsorption and abstraction of hydrogen on polycrystalline diamond," B. D. Thoms, J. N. Russell, Jr., P. E. Pehrsson, and J. E. Butler, Journal of Chemical Physics **100**, 8425 (1994).

6. "Production and characterization of smooth, hydrogen-terminated diamond C(100)," B. D. Thoms, M. S. Owens, J. E. Butler, and C. Spiro, Applied Physics Letters **65**, 2957 (1994).

7. "HREELS scattering mechanism from hydrogenated diamond," B. D. Thoms and J. E. Butler, Physical Review B **50**, 17450 (1994).

8. "Isothermal desorption of hydrogen from polycrystalline diamond films," D. D. Koleske, S. M. Gates, B. D. Thoms, J. N. Russell, Jr., and J. E. Butler, Surface Science Letters **320**, L105 (1994).

9. "Hydrogen on polycrystalline diamond films: Studies of isothermal desorption and atomic deuterium abstraction," D. D. Koleske, S. M. Gates, B. D. Thoms, J. N. Russell, Jr., and J. E. Butler, Journal of Chemical Physics **102**, 992 (1995).

10. "HREELS and LEED of H/C(100): The 2x1 monohydride dimer row reconstruction," B. D. Thoms and J. E. Butler, Surface Science **328**, 291 (1995).

11. "Identification of a surface azide from the reaction of HN_3 with C(100)," B. D. Thoms and J. N. Russell, Jr, Surface Science Letters **337**, L807 (1995) .

12. "Surface Oxidation Chemistry of β-SiC," P. E. Pehrsson and B. D. Thoms, Journal of Vacuum Science and Technology A **15**, 1 (1997).

13. "Gallium Arsenide Surface Chemistry and Surface Damage in a Chlorine High Density Etch Process," C. R. Eddy, Jr., O. J. Glembocki, D. Leonhardt, V. A. Shamamian, R. T. Holm, B. D. Thoms, J. E. Butler, and S. W. Pang, Journal of Electronic Materials **26**, 1320 (1997).

14. "Ion Energy Effects on Surface Chemistry and Damage in a High Density Plasma Etch Process for Gallium Arsenide," D. Leonhardt, C.R. Eddy, Jr., V. A. Shamamian, R. T. Holm, O. J. Glembocki, B. D. Thoms, D. S. Katzer, and J. E. Butler, Japanese Journal of Applied Physics **37**, L577 (1998).

15. "Characterization of Cl_2/Ar High Density Plasmas for Semiconductor Etching," C.R. Eddy, Jr., D. Leonhardt, S.R. Douglass, B.D. Thoms, V.A. Shamamian and J.E. Butler, Journal of Vacuum Science & Technology A **17**, 38 (1999).

16. "Characterization of High Density CH_4/H_2/Ar Plasmas for Compound Semiconductor Etching," C.R. Eddy, Jr., D. Leonhardt, S.R. Douglass, V.A. Shamamian, B.D. Thoms, and J.E. Butler, Journal of Vacuum Science & Technology A **17**, 780 (1999).

17. "HREELS of H/GaN(0001): Evidence for Ga Termination," V. J. Bellitto, B. D. Thoms, D. D. Koleske, A. E. Wickenden, and R. L. Henry, Surface Science **430**, 80 (1999).

18. “Electronic Structure of H/GaN(0001): An EELS Study of Ga-H Formation,” V. J. Bellitto, B. D. Thoms, D. D. Koleske, A. E. Wickenden, and R. L. Henry, Physical Review B **60**, 4816 (1999).

19. “Efficient Electron Stimulated Desorption of Hydrogen from GaN(0001),” V. J. Bellitto, B. D. Thoms, D. D. Koleske, A. E. Wickenden, and R. L. Henry, Physical Review B **60**, 4821 (1999).

20. “Desorption of Hydrogen from GaN(0001) Observed by HREELS and ELS,” V. J. Bellitto, Y. Yang, B. D. Thoms, D. D. Koleske, A. E. Wickenden, and R. L. Henry, Surface Science Letters **442**, L1019 (1999).

21. “Oxygen Adsorption on the (110)-Oriented Diamond Surface,” Bob L. Mackey, John N. Russell, Jr., John E. Crowell, Pehr E. Pehrsson, Brian D. Thoms, and James E. Butler, Journal of Physical Chemistry B **105**, 3803 (2001).

22. “Mass Spectrometry Sampling Method for Characterizing High-density Plasma Etching Mechanisms,” C.R. Eddy, Jr., D. Leonhardt, V.A. Shamamian, J.E. Butler, and B.D. Thoms, Applied Physics Letters **82**, 3626 (2003).

23. “Surface Structure, Composition, and Polarity of Indium Nitride Grown by High Pressure Chemical Vapor Deposition,” R. P. Bhatta, B. D. Thoms, M. Alevli, V. Woods, and N. Dietz, Applied Physics Letters **88**, 122112 (2006).

24. “Carrier Concentration and Surface Electron Accumulation in Indium Nitride Layers Grown by High Pressure Chemical Vapor Deposition,” R. P. Bhatta, B. D. Thoms, A. Weerasekera, A. G. U. Perera, M. Alevli, and N. Dietz, Journal of Vacuum Science & Technology A **25**, 967 (2007).

25. “Surface Electron Accumulation in Indium Nitride Layers Grown by High Pressure Chemical Vapor Deposition,” R. P. Bhatta, B. D. Thoms, M. Alevli, and N. Dietz, Surface Science **601**, L120 (2007).

26. “Desorption of hydrogen from InN $(000\bar{1})$ observed by HREELS,” R. P. Bhatta, B. D. Thoms, M. Alevli, and N. Dietz, Surface Science **602**, 1428 (2008).

27. "Observation of NH_2 species on tilted InN $(01\bar{1}1)$ facets," A. R. Acharya, M. Buegler, R. Atalay, N. Dietz, B. D. Thoms, J. S. Tweedie, and R. Collazo, Journal of Vacuum Science & Technology A **29**, 041402 (2011).

28. “Study of thermal stability of InN epilayers grown by high pressure chemical vapor deposition,” A. R. Acharya, S. Gamage, M. K. I. Senevirathna, M. Alevli, K. Bahadir, A. G. Melton, I. Ferguson, N. Dietz, and B. D. Thoms, Applied Surface Science **268**, 1– 5 (2013).

29. "Integrating Numerical Computation into the Modeling Instruction Curriculum," Marcos D. Caballero, John B. Burk, John M. Aiken, Scott S. Douglas, Erin M. Scanlon, Brian D. Thoms, and Michael F. Schatz, The Physics Teacher **52**, 38 (2014).

30. "Surface structure and surface kinetics of InN grown by plasma-assisted atomic layer epitaxy: A HREELS study," A. R. Acharya, B. D. Thoms, N. Nepal, and C. R. Eddy, Jr., J. Vac. Sci. Technol. A 33, 021401 (2015).

Refereed Conference Proceedings:

1. "Oxidation of CVD Diamond Studied by High Resolution Electron Energy Loss Spectroscopy," P. E. Pehrsson, B. D. Thoms, and J. E. Butler, Proceedings of the 3rd International Symposium on Diamond Materials, in *Diamond Materials* Vol. **93-17** (The Electrochemical Society, Pennington, NJ, 1993) p. 661.

2. "Hydrogen Chemistry on Diamond Surfaces," J. E. Butler, B. D. Thoms, M. McGonigal, J. N. Russell, Jr., and P. E. Pehrsson, in *Wide Band-Gap Electronic Materials*, NATO Meeting/NATO ASI Series Volume, Proceedings of the NATO Advanced Workshop on Wide Band-Gap Semiconductors, Minsk, Belarus, May 4-6, 1994, edited by M. A. Prelas *et al.* (Kluwer Academic Publishers, Dordecht, Netherlands, 1995) pp. 105-114.

3. "Characterization of GaAs Surfaces Subjected to a Cl_2/Ar High Density Plasma Etching Process," C. R. Eddy, Jr., O. J. Glembocki, V. A. Shamamian, D. Leonhardt, R. T. Holm, J. E. Butler, B. D. Thoms, S. W. Pang, K. K. Ko, E. W. Berg, and C. E. Stutz. in *Control of Semiconductor Surfaces and Interfaces* (MRS Proceedings Vol. 448) edited by S. M. Prokes *et al*. (Materials Research Society, Pittsburgh, PA, 1997).

4. "Extremely Efficient Electron Stimulated Desorption of Hydrogen from GaN(0001)," V. J. Bellitto, B. D. Thoms, D. D. Koleske, A. E. Wickenden, and R. L. Henry, in *Proceedings of the 1999 International Conference on Silicon Carbide and Related Materials*, Materials Science Forums **338-342**, 1537 (2000).

5. "The Reaction of Oxygen with GaN(0001)," B. D. Thoms, V. J. Bellitto, Y. Yang, D.D. Koleske, A. E. Wickenden, and R. L. Henry, in *Proceedings of the 1999 International Conference on Silicon Carbide and Related Materials*, Materials Science Forums **338-342**, 1541 (2000).

6. "Adsorption and Desorption of Hydrogen on GaN(0001)," Y. Yang, V. J. Bellitto, B. D. Thoms, D. D. Koleske, A. E. Wickenden, and R. L. Henry, in *Proceedings of the 1999 International Conference on Silicon Carbide and Related Materials,* Materials Science Forums **338-342**, 1533 (2000).

7. "Thermal Desorption of Deuterium from GaN(0001)," Y. Yang, J. Lee, B. D. Thoms, D. D. Koleske, and R. L. Henry, Mat. Res. Soc. Symp. Proc. Vol. 693, I6.4, 2002.

8. "Electron Stimulated Desorption of Deuterium from GaN(0001)," Y. Yang, J. Lee, and B. D. Thoms, Mat. Res. Soc. Symp. Proc. Vol. 743, L11.30, 2003.

9. "Understanding Student Computational Thinking with Computational Modeling," John M. Aiken, Marcos D. Caballero, Scott S. Douglas, John B. Burk, Erin M. Scanlon, Brian D. Thoms, and Michael F. Schatz, AIP Conference Proceedings 1513 (2012 Physics Education Research Conference), pp. 46-49, 2013.

10. "The Initial State of Students Taking an Introductory Physics MOOC," J. M. Aiken, S.-Y. Lin, S. S. Douglas, E. F. Greco, B. D. Thoms, M. F. Schatz, and M. D. Caballero, 2013 Physics Education Research Conference Proceedings, pp. 53-56, 2014.

11. "Student Use of a Single Lecture Video in a Flipped Introductory Mechanics Course," J. M. Aiken, S.-Y. Lin, S. S. Douglas, E. F. Greco, B. D. Thoms, M. D. Caballero, and M. F. Schatz, 2014 Physics Education Research Conference Proceedings, pp. 23-26, 2015.

12. "Peer Evaluation of Video Lab Reports in a Blended Introductory Physics Course," S. S. Douglas, S.-Y. Lin, J. M. Aiken, B. D. Thoms, E. F. Greco, M. D. Caballero and M. F. Schatz, 2014 Physics Education Research Conference Proceedings, pp. 75-78, 2015.

13. "Peer Evaluation of Video Lab Reports in an Introductory Physics MOOC," S.-Y. Lin, S. S. Douglas, J. M. Aiken, C.-L. Liu, E. F. Greco, B. D. Thoms, M. D. Caballero, and M. F. Schatz, 2014 Physics Education Research Conference Proceedings, pp. 163-166, 2015.

Other Technical Papers:

1. "Studies of Adsorption Dynamics on Si(111) 7x7 with Molecular Beam Techniques and Electron Energy Loss Spectroscopy," B. D. Thoms, Ph.D. Dissertation, Cornell University, Ithaca, NY, 1992.

2. "Hydrogen Adsorption and Desorption from Polycrystalline Diamond," B.D. Thoms, P. E. Pehrsson, and J. E. Butler, Proceedings of the 1992 Diamond Conference, Cambridge, UK, 1992.

3. "Hydrogen on Diamond: A Brief Review of Recent Studies," J. E. Butler, B. D. Thoms, P. E. Pehrsson, J. N. Russell, Jr., and J. P. F. Sellschop, Proceedings of the 1993 Diamond Conference, Bristol, UK, 1993.

4. "Diamond Surface Chemistry," J. E. Butler, B. D. Thoms, M. McGonigal, J. N. Russell, Jr., and P. E. Pehrsson, in *Advanced Materials '94* edited by M. Kamo, H. Kanda, Y. Matsui, and T. Sekine, Proceedings of the International Symposium on Advanced Materials '94 (NIRIM, Tsukuba, Japan, 1994).

5. "Diamond Surface Chemistry," P. E. Pehrsson, J. N. Russell, Jr., B. D. Thoms, J. E. Butler, M. Marchywka, and J. M. Calvert, 1994 NRL Review (May 1994), NRL/PU/1200-94-255, pp. 61-71.

6. "Vibrational Spectroscopy of Surface Species on Diamond," P. E. Pehrsson, B. D. Thoms, J. N. Russell, Jr., and J. E. Butler, Proceedings of the 1995 Diamond Conference, Oxford, UK, 1995.

7. "Modifying the Diamond C(100) Surface," B. D. Thoms, in *Advanced Materials '97* edited by Y. Sato, *et. al.*, Proceedings of the International Symposium on Advanced Materials '97 (NIRIM, Tsukuba, Japan, 1997) pp. 91-96.

8. "Enhancing Diversity in Physics Teacher Preparation through the Georgia State University PhysTEC Project," Brian D. Thoms, American Physical Society, Forum on Education Newsletter, Spring 2015.

Presentations at Professional Meetings:

1. "Translationally and Vibrationally Activated Dissociative Adsorption of Hydrogen on Si(111)7x7," B.D. Thoms, P. W. Lorraine, and W. Ho, 1991 American Physical Society March Meeting, Cincinnati, OH, March 18-22, 1991.

2. "Translational and Vibrational Activation of Nitrogen Dissociative Adsorption on Si(111)7x7." P. W. Lorraine, B. D. Thoms, and W. Ho, 1991 American Physical Society March Meeting, Cincinnati, OH, March 18-22, 1991.

3. "A Molecular Beam Study of Ethane on Si(111) 7x7: Energy Accomodation and Trapping," B. D. Thoms, P. W. Lorraine, and W. Ho, 1992 American Physical Society March Meeting, Indianapolis, IN, March 16-20, 1992.

4. "Atomic Hydrogen and Deuterium Adsorption and Abstraction on Polycrystalline Diamond," B.D. Thoms, P. E. Pehrsson, and J. E. Butler, Diamond Synthesis Gordon Research Conference, Plymouth State University, Plymouth, NH, June 14-19, 1992.

5. "Surface Processes on Diamond," J. N. Russell, Jr., M. McGonigal, B.D. Thoms, P. E. Pehrsson, and J. E. Butler, Diamond Synthesis Gordon Research Conference, Plymouth State University, Plymouth, NH, June 14-19, 1992 (invited).

6. "High Temperature Oxidation of -SiC and CVD Diamond Studied by HREELS," P. E. Pehrsson, B.D. Thoms, and J. E. Butler, High Temperature Chemistry Gordon Conference, Kimball Union Academy, Lebanon, NH, June 1992.

7. "Hydrogen Adsorption and Desorption from Polycrystalline Diamond," B.D. Thoms, P. E. Pehrsson, and J. E. Butler, 1992 Diamond Conference, Cambridge, UK, July 5-9, 1992.

8. "Atomic-Hydrogen and Deuterium Adsorption and Abstraction on Polycrystalline Diamond," B.D. Thoms, P. E. Pehrsson, and J. E. Butler, 205th National Meeting of the American Chemical Society, Denver, CO, March 28 - April 2, 1993.

9. "Abstraction of Hydrogen on Polycrystalline Diamond Surfaces Studied by HREELS," B.D. Thoms, J. N. Russell, Jr., P. E. Pehrsson, and J. E. Butler, Combined DARPA/SDIO/ONR Diamond Program Review, Arlington, VA, April 1993.

10. "Oxidation of CVD Diamond Studied by High Resolution Electron Energy Loss Spectroscopy," P. E. Pehrsson, B. D. Thoms, and J. E. Butler, 3rd International Symposium on Diamond Materials, Honolulu, Hi, May 1993.

11. "Hydrogen on Diamond: A Brief Review of Recent Studies," J. E. Butler, B. D. Thoms, P. E. Pehrsson, J. N. Russell, Jr., and J. P. F. Sellschop, 1993 Diamond Conference, Bristol, UK, July 11-14, 1993.

12. “The Structure of H/C(100): Monohydride Dimer 2x1 Reconstruction,” B. D. Thoms, M. S. Owens, J. E. Butler, and C. Spiro, 207th National Meeting of the American Chemical Society, San Diego, CA, March 13-17, 1994.

13. “Diamond Surface Chemistry,” J. E. Butler, B. D. Thoms, M. McGonigal, J. N. Russell, Jr., and P. E. Pehrsson, International Symposium on Advanced Materials ‘94, Tsukuba, Japan, March 14-17, 1994 (invited).

14. “Hydrogen Chemistry on Diamond Surfaces,” J. E. Butler, B. D. Thoms, M. McGonigal, J. N. Russell, Jr., and P. E. Pehrsson, NATO Advanced Workshop on Wide Band-Gap Semiconductors, Minsk, Belarus, May 4-6, 1994 (invited).

15. “The HREELS Scattering Mechanism from Diamond Surfaces,” B. D. Thoms and J. E. Butler, Vibrational Spectroscopy Gordon Conference, Brewster Academy, Wolfeboro, NH, August 14-19, 1994.

16. “Impact Versus Dipole Scattering in HREELS of H/C(100),” B. D. Thoms and J. E. Butler, 41st National Symposium of the American Vacuum Society, Denver, CO, October 24-28, 1994.

17. "Desorption and Abstraction of Hydrogen on Polycrystalline Diamond Surfaces," D. D. Koleske, S. M. Gates, B. D. Thoms, J. N. Russell, Jr., and J. E. Butler, Materials Research Society Meeting, Boston, MA, Nov. 28 - Dec. 2, 1994.

18. “Nitridation of Diamond (100) by Reaction with HN_3 and N_2H_4,” B. D. Thoms and J. N. Russell, Jr., 1995 American Physical Society March Meeting, San Jose, CA, March 20-24, 1995.

19. “Vibrational Spectroscopy of Surface Species on Diamond,” P. E. Pehrsson, B. D. Thoms, J. N. Russell, Jr., and J. E. Butler, 1995 Diamond Conference, Oxford, UK, July 1995.

20. “VUV and Mass Spectrometric Characterization of Cl_2/Ar and CH_4/H_2/Ar ECR Plasmas,” C. R. Eddy, B. D. Thoms, S. Douglass, S. McElvaney, G. Mehlman, and J. E. Butler, 48th Gaseous Electronics Conference, Berkeley, CA, October 9-13, 1995.

21. “Reaction of HN_3 with Diamond (100),” B. D. Thoms and J. N. Russell, Jr., 42nd National Symposium of the American Vacuum Society, Minneapolis, MN, October 16-20, 1995.

22. “Electronic Properties of GaAs Surfaces Subjected to High Density Plasma Etching," C.R. Eddy, Jr., O.J. Glembocki, D.Leonhardt, R.T. Holm, V.A. Shamamian, B.D. Thoms, S.W. McElvaney, and J.E. Butler, International Conference on Metallurgical Coatings and Thin Films 1996, San Diego, CA, April 22-26, 1996.

23. “Infrared Total Internal Reflection Studies of Oxygen on Diamond (110),” B. L. Mackey, J. N. Russell, Jr., B. D. Thoms, J. E. Crowell, J. P. F. Sellschop, P. E. Pehrsson, and J. E. Butler, Diamond Synthesis Gordon Research Conference, Plymouth State University, Plymouth, NH, August 4-9, 1996.

24. "GaAs Surface Chemistry and Surface Damage in a Cl_2/Ar High Density Plasma Etching Process," C. R. Eddy, Jr., O. J. Glembocki, D. Leonhardt, V. A. Shamamian, B. D. Thoms, R. T. Holm, J. E. Butler, and S. W. Pang, 49th Gaseous Electronics Conference, Argonne, IL, October 20-24, 1996.

25. "Characterization of GaAs Surfaces Subjected to a Cl_2/Ar High Density Plasma Etching Process," C. R. Eddy, Jr., D. Leonhardt, V. A. Shamamian, O. J. Glembocki, R. T. Holm, J. E. Butler, B. D. Thoms and S. W. Pang. Fall 1996 Materials Research Society Meeting, Boston, MA December 1-6, 1996.

26. "Modifying the Diamond C(100) Surface," B. D. Thoms, International Symposium on Advanced Materials '97, Tsukuba, Japan, March 3-7, 1997 (invited).

27. "Surface Chemistry and Damage in the High Density Plasma Etching of III-V Materials," D. Leonhardt, C. R. Eddy, Jr., V. A. Shamamian, R. T. Holm, O. J. Glembocki, B. D. Thoms, and J.E. Butler, 44th National Symposium of the American Vacuum Society, San Jose, CA, October 20-24, 1997.

28. "The Interaction of Electrons with Hydrogenated GaN(0001)," V. J. Bellitto, B. D. Thoms, and D. D. Koleske, 45th International Symposium of the American Vacuum Society, Baltimore, MD, November 2-6, 1998.

29. "Adsorption and Desorption of Hydrogen on GaN(0001)," Y. Yang, V. J. Bellitto, B. D. Thoms, D. D. Koleske, and A. E. Wickenden, 1999 Centennial Meeting of the American Physical Society, Atlanta, GA, March 20-26, 1999.

30. "Electron Stimulated Processes on Hydrogenated GaN(0001)," B. D. Thoms, V. J. Bellitto, D. D. Koleske, and A. E. Wickenden, 1999 Centennial Meeting of the American Physical Society, Atlanta, GA, March 20-26, 1999.

31. "HREELS of H/GaN(0001): Evidence for Gallium Surface Termination," V. J. Bellitto, B. D. Thoms, D. D. Koleske, and A. E. Wickenden, 1999 Centennial Meeting of the American Physical Society, Atlanta, GA, March 20-26, 1999.

32. "Adsorption and Desorption of Hydrogen on GaN(0001)," Y. Yang, V. J. Bellitto, B. D. Thoms, D. D. Koleske, A. E. Wickenden, and R. L. Henry, International Conference on Silicon Carbide and Related Materials 1999, Research Triangle Park, NC, October 10-15, 1999.

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34. "Extremely Efficient Electron Stimulated Desorption of Hydrogen from GaN(0001)," V. J. Bellitto, B. D. Thoms, D. D. Koleske, A. E. Wickenden, and R. L. Henry, International Conference on Silicon Carbide and Related Materials 1999, Research Triangle Park, NC, October 10-15, 1999.

35. "The Reaction of Oxygen with GaN(0001)," B. D. Thoms, V. J. Bellitto, D. D. Koleske, A. E. Wickenden, and R. L. Henry, 46th International Symposium of the American Vacuum Society, Seattle, WA, October 25-29, 1999.

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39. "Hydrogen Removal Mechanisms from Gallium Nitride," B. D. Thoms, Y. Yang, and J. Lee, AVS 49th International Symposium, Denver, CO, Nov., 4-8, 2002.

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41. "Comparison of Ga- and N-polar GaN Surfaces," R. P. Bhatta, B. D. Thoms, C. R. Eddy, R. T. Holm, and R. L. Henry, AVS 51st International Symposium, Anaheim, CA, Nov. 14-19, 2004.

42. "Electron Spectroscopies of InN Grown by HPCVD," R. P. Bhatta, B. D. Thoms, M. Alevli, V. Woods, and N. Dietz, AVS 52nd International Symposium, Boston, MA, Oct. 30-4, 2005.

43. "Surface Electron Accumulation in Indium Nitride Layers," R. P. Bhatta, B. D. Thoms, A. Weerasekera, A. G. U. Perera, M. Alevli, and N. Dietz, AVS 53rd International Symposium, San Francisco, CA, Nov. 12-17, 2006.

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47. "Teaching Laboratory and Research Skills as Preparation for Careers in Science and Education," B. D. Thoms, 2007 APS March Meeting, Denver, CO, March 5-9, 2007.

48. “Desorption of Hydrogen from the Indium Nitride Surface Studied by HREELS,” R. P. Bhatta, B. D. Thoms, M. Alevli, and N. Dietz, AVS 54th International Symposium, Seattle, WA, Oct. 14-19, 2007.

49. “Effect of Hydrogen on Surface Electron Accumulation in InN Films,” R. P. Bhatta, B. D. Thoms, M. Alevli, and N. Dietz, 2008 APS March Meeting, New Orleans, LA, March 10-14, 2008.

50. “Role of Adsorbates in Surface Electron Accumulation on InN Films,” R. P. Bhatta, A. R. Acharya, B. D. Thoms, M. Alevli, and N. Dietz, AVS 55th International Symposium, Boston, MA, Oct. 19-24, 2008.

51. “Implementing Studio Physics for Algebra-based Introductory Courses at Georgia State University,” Cherilynn Morrow, John Evans, and Brian Thoms, SACS-AAPT Fall 2008 Meeting, Kennesaw State University, Kennesaw, GA, Oct. 24-25, 2008.

52. “Electron accumulation on bare and hydrogenated indium nitride surfaces,” B. D. Thoms, R. P. Bhatta, A. R. Acharya, M. Alevli and N. Dietz, 2009 APS March Meeting, Pittsburgh, PA, March 16-20, 2009.

53. "Composition and Structure of HPCVD-grown InGaN," Ananta Acharya, Max Buegler, Goksel Durkaya, Brian Thoms, and Nikolaus Dietz, 76th Annual Meeting of the Southeastern Section of APS, November 11–14, 2009, Atlanta, Georgia.

54. "Assessing the Effectiveness of Studio Physics in Introductory-Level Courses at Georgia State University," Brianna Upton, John Evans, Cherilynn Morrow, and Brian Thoms, 76th Annual Meeting of the Southeastern Section of APS, November 11–14, 2009, Atlanta, Georgia.

55. “Assessing Introductory Algebra-based Studio Physics at an Urban University,” B. Upton, B. D. Thoms, J. R. Evans, and C. A. Morrow, Gordon Research Conference on Physics Research & Education, Mount Holyoke College, South Hadley, MA, June 6-11, 2010.

56. “Assessing Introductory Algebra-based Studio Physics at an Urban University,” B. Upton, B. D. Thoms, J. R. Evans, and C. A. Morrow, AAPT Summer 2010 Meeting, Portland, OR, July 17-21, 2010.

57. “The relationship between surface termination and crystal structure for HPCVD- grown InN layers,” Ananta R. Acharya, Max Buegler, Sampath Gamage, James Tweedie, Ramon Collazo, Nikolaus Dietz, and Brian D. Thoms, AVS 57th International Symposium, Albuquerque, NM, Oct. 18-23, 2010.

58. “Substrate template and V/III-ratio effects on the surface and structural properties of HPCVD grown InN films,” Ananta R. Acharya, Max Buegler, Ramazan Atalay, Sampath Gamage, James Tweedie, Ramon Collazo, Nikolaus Dietz, and Brian D. Thoms, AVS 58th International Symposium, Nashville, TN, Oct. 30 - Nov. 4, 2011.

59. “Thermal stability of HPCVD grown InN epilayers,” Ananta R. Acharya, Sampath Gamage, Nikolaus Dietz and Brian D. Thoms, AVS 58th International Symposium, Nashville, TN, Oct. 30 - Nov. 4, 2011.

60. “Exploring the Integration of Computational Modeling in the ASU Modeling Curriculum,” John M. Aiken, John B. Burk, Marcos D. Caballero, Michael F. Schatz, and Brian D. Thoms, SACS-AAPT Fall 2011 (joint meeting with NCS-AAPT), Asheville, NC, Nov. 18-19, 2011.

61. “Self-efficacy in Classroom Style Choice,” Alan S. Cummings, John M. Aiken, and Brian D. Thoms, SACS-AAPT Fall 2011 (joint meeting with NCS-AAPT), Asheville, NC, Nov. 18-19, 2011.

62. “Improving Future High School Physics Teachers’ Preparedness,” Brian D. Thoms, Sumith Doluweera, and Brett Criswell, SACS-AAPT Fall 2011 (joint meeting with NCS-AAPT), Asheville, NC, Nov. 18-19, 2011.

63. “Computational Modeling Integrated with ASU Modeling Instruction: Implementation and Assessment,” John M. Aiken, John B. Burk, Marcos D. Caballero, Michael F. Schatz, and Brian D. Thoms, AAPT Winter 2012 meeting, Ontario, CA, Feb. 6-8, 2012.

64. “Improving Future High School Physics Teachers’ Preparedness,” Brian D. Thoms, Sumith Doluweera, and Brett Criswell, AAPT Winter 2012 meeting, Ontario, CA, Feb. 6-8, 2012.

65. "Implementing and Assessing Computational Modeling in the Modeling Instruction Curriculum," John M. Aiken, Brian D. Thoms, Scott S. Douglas, Michael F. Schatz, Erin Scanlon, John B. Burk, and Marcos D. Caballero, Southern Atlantic Coast Section of American Association of Physics Teachers (SACS-AAPT) Spring 2012 Meeting, Athens, GA, April 20-21, 2012.

66. "What are Faculty Expectations of Undergraduate Students’ Preparation for Quantum Mechanics?" Christopher A. Oakley, John M. Aiken, Brian D. Thoms, Southern Atlantic Coast Section of American Association of Physics Teachers (SACS-AAPT) Spring 2012 Meeting, Athens, GA, April 20-21, 2012.

67. “Analysis of Newton’s Third Law Questions on the Force Concepts Inventory at Georgia State University,” Christopher A. Oakley and Brian D. Thoms, APS April Meeting 2012, March 31-April 3, 2012, Atlanta, Georgia.

68. “Exploring the Integration of Computational Modeling in the ASU Modeling Curriculum,” Michael Schatz, John Aiken, John Burk, Marcos Caballero, Scott Douglas, and Brian Thoms, APS April Meeting 2012, March 31-April 3, 2012, Atlanta, Georgia.

69. “Assessing the Integration of Computational Modeling and ASU Modeling Instruction in the High School Physics Classroom,” John Aiken, Michael Schatz, John Burk, Marcos Caballero, and Brian Thoms, APS April Meeting 2012, March 31-April 3, 2012, Atlanta, Georgia.

70. “Instructor Expectations of Undergraduate Students Entering Quantum Mechanics,” C. A. Oakley, J. M. Aiken, B. D. Thoms, 2012 Summer AAPT Meeting, Philadelphia, PA, July 28-August 1, 2012.

71. “Structural, Compositional, and Thermal Stability Studies on $In_{1-x}Ga_xN$ Epilayers,” A. Acharya, Georgia State University, M. Buegler, S.D. Gamage, N. Dietz, B. Thoms, AVS 59th International Symposium, Tampa, FL, October 28-November 2, 2012.

72. “Interviews and Assignment Analysis of Undergraduate Students Entering Quantum Mechanics,” B. D. Thoms, C. A. Oakley, J. M. Aiken, 2013 Winter AAPT Meeting, New Orleans, LA, January 5-9, 2013.

73. “Analysis of Faculty and Student Interviews on Undergraduate Quantum Mechanics,” C. A. Oakley and B. D. Thoms, 2013 Summer AAPT Meeting, Portland, OR, July 13-17, 2013.

74. “Faculty and Undergraduate Student Perspectives on Evaluation in Upper-Division Courses,” C. A. Oakley and B. D. Thoms, 2013 Summer AAPT Meeting, Portland, OR, July 13-17, 2013.

75. “Evaluations of video lab reports in an introductory physics MOOC,” S.-Y. Lin, J. M. Aiken, E. Greco, S. S. Douglas, M. F. Schatz, M. D. Caballero, B. D. Thoms, and J. B. Burk, 2013 Summer AAPT Meeting, Portland, OR, July 13-17, 2013.

76. “Student Understanding of Newton’s Second Law with Computational Modeling,” J. M. Aiken, S.-Y. Lin, S. S. Douglas, M. F. Schatz, M. D. Caballero, J. B. Burk, B. D. Thoms, 2013 Summer AAPT Meeting, Portland, OR, July 13-17, 2013.

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78. “Faculty and Undergraduate Student Perspectives on Evaluation in Upper-Division Courses,” C. A. Oakley and B. D. Thoms, 2013 Physics Education Research Conference, Portland, OR, July 17-18, 2013.

79. “An Introductory Physics MOOC with Video Lab Reports: Design, Implementation, and Challenges,” J. M. Aiken, S. S. Douglas, S.-Y. Lin, M. F. Schatz, B. D. Thoms, and M. D. Caballero, 2013 Physics Education Research Conference, Portland, OR, July 17-18, 2013.

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81. “Undergraduate Pathway to Teaching Physics at Georgia State University,” B. D. Thoms, M. E. Walker, S. Doluweera, and J. Von Korff, 2013 Fall SACS-AAPT Meeting, Greenville, SC, October 25-26, 2013.

82. “Surface Structure, Polarity and Surface Kinetics of InN Grown by Plasma – Assisted Atomic Layer Epitaxy: A HREELS Study,” A. Acharya, N. Nepal, C. Eddy, and B. D. Thoms, AVS 60th International Symposium, Long Beach, CA, October 27 - November 1, 2013.

83. “Undergraduate Pathway to Teaching Physics at Georgia State University,” B. D. Thoms, M. E. Walker, S. Doluweera, and J. Von Korff, 2014 Winter AAPT Meeting, Orlando, FL, January 4-7, 2014.

84. “The Half Day TIR and Classroom Teacher,” M. E. Walker, B. D. Thoms, S. Doluweera, and J. Von Korff, 2014 Spring SACS-AAPT Meeting, Atlanta, GA, March 21-22, 2014.

85. “The Part-time TIR model,” Panel participants: Chuhee Kwon, Jon Anderson, Kurt Fletcher, Brian Thoms, and Katie Beck, 2014 Physics Teacher Education Coalition Conference, Austin, TX, May 19-20, 2014.

86. “The Part-time TIR and Classroom Teacher,” M. E. Walker, B. D. Thoms, S. Doluweera, and J. Von Korff, 2014 Summer AAPT Meeting, Minneapolis, MN, July 26-30, 2014.

87. “Measuring Centripetal Acceleration with a Liquid Accelerometer,” D. G. Sumith P. Doluweera, B. D. Thoms, O. I Olesya, M. Rusert, C. Butler, and J. Von Korff, 2014 Summer AAPT Meeting, Minneapolis, MN, July 26-30, 2014.

88. “Describing Video Viewing Behavior in a Flipped Introductory Mechanics Course,” J. M. Aiken, S.-Y. Lin, S. S. Douglas, E. F. Greco, M. F. Schatz, B. D. Thoms, M. D. Caballero, 2014 Physics Education Research Conference, Minneapolis, MN, July 17-18, 2014.

89. “Using the Tools of Online Analytics and Big Data in the On-Campus Classroom,” J. M. Aiken, S.-Y. Lin, S. S. Douglas, B. D. Thoms, M. D. Caballero, and M. F. Schatz, 2014 Physics Education Research Conference, Minneapolis, MN, July 17-18, 2014.

90. “Peer Evaluations of Video Lab Reports in an Introductory Physics MOOC,” S.-Y. Lin, S. S. Douglas, J. M. Aiken, E. F. Greco, M. F. Schatz, B. D. Thoms, and M. D. Caballero, 2014 Physics Education Research Conference, Minneapolis, MN, July 17-18, 2014.

91. “Becoming a Scientist: Development of Research Skills through Senior Research Projects,” Sawaiz Syed, Brian Thoms, and Xiaochun He, Fall 2014 Meeting of Southeast Atlantic Coast Section of American Association of Physics Teachers, Charleston, SC, October 24-25, 2014.

92. Developing PCK in physics teachers: Collaboration between scientist and educator. Stoll, W. A., Thoms, B. D., Criswell, B., Demir, K., & Doluweera, S., 2015 AAPT Winter Meeting, San Diego, CA, January 3-6, 2015.

93. “Enhancing Diversity in Physics Teacher Preparation through the Georgia State University PhysTEC Project,” Brian D. Thoms, Joshua Von Korff, and Sumith Doluweera, 2015 Physics Teacher Education Coalition Conference, Seattle, WA, February 5-7, 2015.

94. “Enhancing Diversity in Physics Teacher Preparation through the Georgia State University PhysTEC Project,” Brian D. Thoms, Joshua Von Korff, and Sumith Doluweera, 2015 Summer AAPT Conference, College Park, MD, July 26-30, 2015.

95. “How Does Laboratory Reform Affect Students’ Learning Attitudes?,” Zeynep Topdemir, Nate Trusty, and Brian Thoms, 2015 Summer AAPT Conference, College Park, MD, July 26-30, 2015.

96. “Reforming Calculus-based Introductory Physics Labs at Georgia State University and their Effect on Students' Learning,” D. G. Sumith Doluweera and Brian Thoms, 2015 Summer AAPT Conference, College Park, MD, July 26-30, 2015.

97. “Reforming calculus-based introductory physics labs at Georgia State University and its effect on students' learning,” D.G. Sumith Doluweera, Brian Thoms, Joshua Von Korff, 2015 Physics Education Research Conference, College Park, MD, July 29-30, 2015.

98. “The Effect of Laboratory Reform on Students’ Learning and Attitudes,” Zeynep Topdemir, David N. Trusty, and Brian D. Thoms, Fall 2015 Meeting of Southeast Atlantic Coast Section of American Association of Physics Teachers, Charleston, SC, October 30-31, 2015.

99. “Mechanical Equilibrium,” Sumith Doluweera and Brian Thoms, Fall 2015 Meeting of Southeast Atlantic Coast Section of American Association of Physics Teachers, Charleston, SC, October 30-31, 2015.

100. “Partnering Effectively with Schools of Education,” Panel participants: Brian Thoms (chair), Karen Magee-Sauer, Scott Paulson, Valerie Otero, Stamatis Vokos, and Karen King, 2016 Physics Teacher Education Coalition Conference, Baltimore, MD, March 11-13, 2016.

101. “Assessing a Laboratory Redesign with Tutorials and Inquiry-Based Experiments,” Zeynep Topdemir, David N. Trusty, Ebru Oncul, Brian D. Thoms, D. Sumith Doluweera, and Joshua Von Korff, 2016 Physics Teacher Education Coalition Conference, Baltimore, MD, March 11-13, 2016.

102. “Assessing Effects of SCALE-UP on Conceptual Learning and Students’ Attitudes,” Zeynep Topdemir, Ebru Oncul, and Brian D. Thoms, Spring 2016 Meeting of Southeast Atlantic Coast Section of American Association of Physics Teachers, Morrow, GA, April 15-16, 2016.

103. “The Effect of a Redesign on Student Evaluations of Calculus-based Introductory Physics Labs,” Saif Ali and Brian D. Thoms, Spring 2016 Meeting of Southeast Atlantic Coast Section of American Association of Physics Teachers, Morrow, GA, April 15-16, 2016.

104. “Building thriving undergraduate physics programs,” Panel participants: Paul Beale, Nancy Donaldson, Willie Rockward, and Brian Thoms, 2016 Physics Department Chairs Conference, College Park, MD, June 2-4, 2016.

105. “Comparison of Lecture/Laboratory Format with SCALE-UP Classes,” Zeynep Topdemir, Ebru Oncul, David Trusty, and Brian Thoms, 2016 Summer APPT Conference, Sacramento, CA, July 16-20, 2016.

106. “Students’ understanding of “Centripetal Acceleration” as evidenced by answers to a guided inquiry based lab,´ D. G. Sumith Doluweera, Brian Thoms, Joshua Von Korff, and Carola Butler, 2016 Summer APPT Conference, Sacramento, CA, July 16-20, 2016.

107. “Key Factors in Introductory Physics Performance: A Four-year Study,” Brian Thoms, Saif Ali, Donna Babihuga, and Alexander Coston, 2016 Summer APPT Conference, Sacramento, CA, July 16-20, 2016.

108. “The Effects of SCALE-UP Intervention in Algebra-Based Introductory Physics Classes,” Zeynep Topdemir, David Trusty, Ebru Oncul, Brian Thoms, 2016 Summer APPT Conference, Sacramento, CA, July 16-20, 2016.

109. “The Effects of Laboratory Redesign on Conceptual Learning, Success-Withdrawal Rates and Learning Attitudes,” Zeynep Topdemir, David Trusty, and Brian Thoms, 2016 Physics Education Research Conference, Sacramento, CA, July 20-21, 2016.

110. “Cultivating Relationships with Schools of Education,” Panel participants: Brian Thoms (Chair), Renee’ Schwartz, Talat Rahman, and Pamela Carroll, 2017 Physics Teacher Education Coalition Conference, Atlanta, GA, February 17-18, 2017.

111. “Building Support with your Departmental Colleagues,” Panel participants: Brian Thoms (Chair), Mel Sabella, Scott Severson, and Gay Stewart, 2017 Physics Teacher Education Coalition Conference, Atlanta, GA, February 17-18, 2017.

112. “Recruiting and Supporting URM Students to Physics Programs,” Panel participants: Willie Rockward (Chair), Brian Thoms and Marta Dark McNeese, 2017 Physics Teacher Education Coalition Conference, Atlanta, GA, February 17-18, 2017.

113. “Getting Buy-in for Physics Teacher Preparation: Lessons from GSU Experience,” Brian Thoms, invited presentation, 2017 Winter American Association of Physics Teachers Meeting, Atlanta, GA, February 19-21, 2017.

114. “Understanding Two Similar Course Reforms,” Zeynep Topdemir, Ebru Oncul, and Brian Thoms, 2017 Winter American Association of Physics Teachers Meeting, Atlanta, GA, February 19-21, 2017.

115. “Can Lecture Be as Effective as SCALE-UP? Teaching Old Dogs New Tricks,” Ebru Oncul, Zeynep Topdemir, and Brian Thoms, 2017 Winter American Association of Physics Teachers Meeting, Atlanta, GA, February 19-21, 2017.

Seminars and Colloquia:

1. “Atomic Hydrogen and Deuterium Adsorption and Abstraction on Polycrystalline Diamond,” National Institute of Standards and Technology, Gaithersburg, MD, April 1993.

2. “LEED and HREELS of H/C(100): The Monohydride Dimer Row Reconstruction,” Physics Department Seminar, Howard University, Washington, DC, January 1994.

3. “The Role of Hydrogen in the Chemical Vapor Deposition of Diamond,” Chemistry Department Seminar, George Washington University, Fairfax, VA, June 1994.

4. “The Role of Hydrogen in the Chemical Vapor Deposition of Diamond,” Seminar, Aerodyne Corporation, Billerica, MA, August 19, 1994.

5. “Investigations of Diamond Growth and Modification,” Physics Department Seminar, New Jersey Institute of Technology, Newark, NJ, March 1995.

6. “Investigations of Diamond Growth and Modification: Challenges and Solutions,” Electronics Division Seminar, Naval Research Laboratory, Washington, DC, March 30, 1995.

7. "The Role of Hydrogen in the Chemical Vapor Deposition of Diamond," Physics Department Seminar, Georgia State University, April 20, 1995.

8. "Modification of the Diamond C(100) Surface," Physics Department Seminar, University of Alabama at Birmingham, Birmingham, AL, November 8, 1996.

9. "Modifying the Diamond C(100) Surface," Chemistry Department Seminar, Emory University, Atlanta, GA, March 28, 1997.

10. "The Reactions of Hydrogen and Electrons on GaN(0001): A Possible Method of Non-thermal *in-situ* Patterning," Electronics Division Seminar, Naval Research Laboratory, Washington, DC, April 22, 1999.

11. "Electron Spectroscopic Studies of Hydrogen on GaN(0001)," Condensed Matter Physics Seminar, Boston University, Boston, MA, November 19, 1999.

12. "The Reactions of Hydrogen and Electrons on GaN(0001): A Possible Method of Non-thermal *in-situ* Patterning," Physics Department Seminar, Clark Atlanta University, Atlanta, GA, February 17, 2000.

13. "Surface Science: The Path from the Photoelectric Effect to Wide Bandgap Semiconductors," Physics Department Seminar Series for World Year of Physics, State University of West Georgia, Carrollton, GA, February 25, 2005.

14. "Indium Nitride: Connections Between Surfaces and Devices," Physics Department Seminar, Clark Atlanta University, Atlanta, GA, April 2, 2009.

15. "Student Centered Active Learning Environment," Teaching with Technology Conference, Georgia State University, Nov. 2-3, 2010, John Evans and Brian Thoms.

16. "A Tale of Two Course Reforms: Effects on Students' Conceptual Learning and Attitudes," Physics Department Seminar, Kennesaw State University, Marietta, GA, Nov. 6, 2015.

External Grants:

1. "Spatially Selective Growth and Modification of Wide Bandgap Semiconductor Surfaces," awarded by Office of Naval Research for period of 1/1/1996-10/3/1996. Role: Principal Investigator. Amount: $50,000.

2. "Computational Thinking: 21st Century STEM Problem-Solving Practices for Georgia Students," Subcontract with Georgia Tech from Georgia Race to the Top Grant awarded for period 1/1/2013-9/30/2014. Role: Principal Investigator on subcontract. Amount: $69,333.

3. "PhysTEC Comprehensive Site at Georgia State University," awarded by the Physics Teacher Education Coalition (administered by American Physical Society) for period of 8/1/2013-7/31/2016. Role: Principal Investigator. Amount: $300,000.

4. “Collaborative Research: Investigating Institutional Success at Overcoming Challenges in Algebra-based Studio Physics,” awarded by National Science Foundation for period of 1/1/2014-12/31/2016. Role: Co-Investigator. Amount: $180,962.

5. “Atlanta’s Professional Preparation for Enhancing Argumentation through Laboratories in Physical Science (APPEAL-PS),” awarded by State of Georgia Improving Teacher Quality Grants program through University of Georgia, for period of 2/15/2016 through 5/31/2017. Role: Co-Investigator. Amount: $55,478.

Internal Grants:

1. “Spatially Selective Growth and Modification of Wide Bandgap Semiconductor Surfaces,” awarded by GSU Equipment Matching Program for period of 1/1/1996-60/30/1996. Role: Principal Investigator. Amount: $50,000.

2. “Surface Properties of Wide Bandgap Semiconductors: Nitride Sample Preparation Chamber,” awarded by GSU Quality Improvement Program for period 1/1/1996-6/30/1996. Role: Principal Investigator. Amount: $24,000.

3. “Temperature Programmed Desorption: A Key Tool for Understanding Surface Processes,” awarded by GSU Quality Improvement Program for period 1/1/1997-6/30/1997. Role: Principal Investigator. Amount: $19,000.

4. “Patterning the Gallium Nitride Surface Using Electrons,” awarded by GSU Research Initiation Grant Program for period 7/1/1997-6/30/2000. Role: Principal Investigator. Amount: $5,000.

5. “Teaching Laboratory Skills, Teamwork, and Research Skills as Preparation for Careers in Science and Education,” Metro Atlanta PRISM Mini-Grant Program, awarded 1/18/06, Role: Principal Investigator. Amount: $12,500.

6. “Learning Physics in Studio,” GSU STEM Faculty Fellowship, 7/1/2009-6/30/2010, Role: Principal Investigator. Amount: $7500.

7. “Learning Physics in Studio,” GSU STEM Faculty Fellowship, 7/1/2010-6/30/2011, Role: Principal Investigator. Amount: $7500.

8. “What Limits the Learning of Students in Introductory Physics Courses at GSU?,” STEM Initiative Mini-grant, 7/1/2011-6/30/2012, Role: Principal Investigator. Amount: $8000.

9. “Flipped Classroom: Introductory Algebra-based Physics,” awarded by GSU Provost and Center for Innovative Instruction for period 1/1/2014-7/31/2015. Role: Co-Investigator. Amount: $40,000.

10. “Biomechanics Laboratory Education,” STEM minigrant awarded to Mark Geil, Jianhua Wu, and Brian Thoms for period 5/1/2014-12/31/2014. Role: Co-Investigator. Amount: $6000.

Awards and Recognitions:

1. Award of Achievement, 1994-1995 Technical Publications and Art Competition, The Society for Technical Communication, Washington, DC Chapter, for the article "Diamond Surface Chemistry" by P. E. Pehrsson, J. N. Russell, Jr., B. D. Thoms, J. E. Butler, M. Marchywka, and J. M Calvert, 1994 NRL Review, pp. 61-71.

2. Physics Teacher Education Coalition (PhysTEC) "The 5+ Club" awarded to Georgia State University for 2013-2014 academic year for graduating 5 or more well-qualified physics teachers in a given year.

3. Physics Teacher Education Coalition (PhysTEC) "The 5+ Club" awarded to Georgia State University for 2015-2016 academic year for graduating 5 or more well-qualified physics teachers in a given year.

Courses Taught:

Georgia State University

Phys1000/7000, Gateway to Physics/Gateway to Physics for Teachers
Phys1111, Introductory Physics I
Phys1112, Introductory Physics II
Phys2211, Principles of Physics I
Phys2212, Principles of Physics II
Phys3300, Advanced Physics Laboratory
Phys3401, Modern Physics I
Phys3402, Modern Physics II
Phys3901, Modern Physics Laboratory I
Phys3902, Modern Physics Laboratory II
Phys4900, Research Project
Phys7210, Physics Principles & Teaching Problems I
Phys7220, Physics Principles & Teaching Problems II

Joshua S. Von Korff

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Georgia State University
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Atlanta, GA 30303

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Web: http://www.phy-astr.gsu.edu/new_web/14318.html

Education

Harvard University	B.A.	Physics	2001
University of California, Berkeley	Ph.D.	Physics	2010

Professional Employment

Assistant Professor, Department of Physics and Astronomy, Georgia State University, Atlanta, GA, 9/2012 to present.

Postdoctoral Research Associate, Physics Education Research, Kansas State University, Manhattan, KS, 9/2010 to 8/2012.

Publications

Peer-reviewed publications:

J. Von Korff, A. Bayat Barooni, H. Pamplin, and J. J. Chini, "The 'revisiting' strategy in physics tutorials," Physics Education Research Conference Proceedings (2016).

M. Cook and J. Von Korff, "Role-plays for preparing physics teaching assistants and learning assistants," Physics Education Research Conference Proceedings (2016).

J. Von Korff, B. Archibeque, K. Alison Gomez, T. Heckendorf, S. B. McKagan, E. C. Sayre, E. W. Schenk, C. Shepherd, and L. Sorell, "Secondary analysis of teaching methods in introductory physics: A 50k-student study," American Journal of Physics, 84, 969 (2016).

J. Von Korff, C. Zhan, B. Vaishnav, J. J. Chini, A. Warneke, and O. Sengul, "The use of representations in evidence-based and non-evidence-based physics activities," Physics Education Research Conference Proceedings (2015).

A. J. Westphal et al., "Evidence for interstellar origin of seven dust particles collected by the Stardust spacecraft," Science 345, pp. 786-791 (2014).

J. Von Korff and N. S. Rebello, "Distinguishing between 'change' and 'amount' infinitesimals in first-semester calculus-based physics," American Journal of Physics 82, 695 (2014).

J. Von Korff, A. Elby, D. Hu, and N. S. Rebello, "Student Epistemology About Mathematical Integration In A Physics Context: A Case Study," Physics Education Research Conference Proceedings (2013).

J. Von Korff et al., "Astropulse: a search for microsecond transient radio signals using distributed computing: I. Methodology," Astrophysical Journal 767(1), (2013).

J. Von Korff and N. S. Rebello, "Teaching Integration with Layers and Representations: A Case Study," Physical Review Special Topics - Physics Education Research 8, 010125 (2012). http://prst-per.aps.org/abstract/PRSTPER/v8/i1/e010125

J. Von Korff, D. Hu, and N. S. Rebello,"Assessment of vertical transfer in problem solving: classifying construct validity threats," In eds. C. Singh, N. S. Rebello, and P. Engelhardt, Physics Education Research Conference Proceedings (2011).

D. Hu, J. Von Korff, and N. S. Rebello, "Scaffolding students' application of the 'area under a curve' concept in physics problems," In eds. C. Singh, N. S. Rebello, and P. Engelhardt, Physics Education Research Conference Proceedings (2011).

A. Siemion, J. Von Korff, *et al.*, "New SETI sky surveys for radio pulses," Acta Astronautica, Volume 67, Issues 11-12, December 2010, p. 1342-1349.

J. Von Korff. Astropulse: A search for microsecond transient radio signals using distributed computing. Ph.D. dissertation, University of California, Berkeley, 2010.

J. Von Korff and J. Kempe. Quantum advantage in transmitting a permutation, *Phys. Rev. Lett.* 93, 260502, 2004.

J. Von Korff. Classification of greedy subset-sum-distinct sequences, *Discrete Mathematics*, 271, 271-282, 2003.

Non-peer-reviewed publications

J. Von Korff, *et al.* Astropulse and Fly's Eye: SETI searches for transient radio signals using distributed computing, *ASP Conference Series, Vol. 420: Bioastronomy 2007: Molecules, Microbes, and Extraterrestrial Life*. (2009), p. 447-452.

J. Von Korff, A. J. Westphal, and D. P. Anderson, A method for combining judgements in distributed decision making, applied to the Stardust project, *Lunar and Planetary Science Conference XXXVII* (2006), abstract #1985.

A. J. Westphal, J. Von Korff, *et al.* Stardust@home: virtual microscope validation and first results, *Lunar and Planetary Science Conference XXXVII* (2006), abstract #2225.

Talks presented at conferences:

J. Von Korff and A. Bayat Barooni. Principles for Research-based Physics Activities. American Association of Physics Teachers, Sacramento, 2015.

M. Cook and J. Von Korff, An Activity-based Model for Training Physics Teaching and Learning Assistants. American Association of Physics Teachers, Sacramento, 2016.

D. G. Sumith Doluweera, B. Thoms, J. Von Korff, and C. Butler, Students' Understanding of 'Centripetal Acceleration' as Evidenced by Answers to a Guided Inquiry-based lab. American Association of Physics Teachers, Sacramento, July 2016.

O. Sengul, L. Kiepura, and J. Von Korff. How do Course Materials address students' Learning difficulties? American Association of Physics Teachers, Minneapolis, July 2014

J. Von Korff. Barriers faced by Learning Assistants in a studio physics course. American Association of Physics Teachers, Orlando, January 2014.

J. Von Korff and N. S. Rebello. A taxonomy of infinitesimals in first-semester introductory physics. American Association of Physics Teachers, New Orleans, January 2013.

J. Von Korff, D. Hu, and N. S. Rebello. Learning integration in physics using debate problems and multimodal communication. American Association of Physics Teachers, Ontario, February 2012.

J. Von Korff and N. S. Rebello. Assessing Student Understanding of Integrals Using Correspondence Between Representations. American Association of Physics Teachers, Philadelphia, July-August 2012.

J. Von Korff, D. Hu, and N. S. Rebello. The influence of hints and training on student resource selection. American Association of Physics Teachers, Omaha, August 2011.

J. Von Korff, D. Hu, and N. S. Rebello. TAs' ways of talking about students' problem solving difficulties. American Association of Physics Teachers, Jacksonville, January 2011.

Invited talks and colloquia:

J. Von Korff. A joint pedagogy course for Learning Assistants and Teaching Assistants. American Physical Society March Meeting. Baltimore, MD, 2016.

J. Von Korff. Two decades of FCI and FMCE gains: a meta-analysis. American Association of Physics Teachers Conference. College Park, MD, 2015.

J. Von Korff. Identifying obstacles to instruction in introductory physics. University of Alabama, Birmingham. March 2013.

Posters presented at conferences:

J. Von Korff, A. Bayat Barooni, H. Pamplin, and J. J. Chini, "The 'revisiting' strategy in physics tutorials," Physics Education Research Conference Proceedings (2016).

M. Cook and J. Von Korff, "Role-plays for preparing physics teaching assistants and learning assistants," Physics Education Research Conference Proceedings (2016).

J. Von Korff, C. Zhan, B. Vaishnav, J. J. Chini, A. Warneke, and O. Sengul, "The use of representations in evidence-based and non-evidence-based physics activities, Physics Education Research Conference, College Park, July 2015.

J. Von Korff, Students' use of prior knowledge when reading a passage about introductory physics, Physics Education Research Conference, Minneapolis, July 2014.

O. Sengul, L. Kiepura, and J. Von Korff. Identifying the different implementations of studio physics: document analysis, American Association of Physics Teachers, Minneapolis, July 2014.

J. Von Korff, A. Elby, D. Hu, and N. S. Rebello. Student Epistemology About Mathematical Integration In A Physics Context: A Case Study. Physics Education Research Conference 2013.

J. Von Korff, A. Smith, and M. Smith. Learning Assistants' self-reported barriers in an algebra-based physics studio. FFPER (Frontiers and Foundations in Physics Education Research) 2013.

J. Von Korff and N. S. Rebello. Symbolic forms for infinitesimal and finite quantities in introductory physics. American Association of Physics Teachers, New Orleans, January 2013.

J. Von Korff, D. Hu, and N. S. Rebello. Physics Students' Use of Layers and Representations to Understand Integrals. American Association of Physics Teachers, Philadelphia, July-August 2012.

J. Von Korff, D. Hu, and N. S. Rebello. Communication about integrals as a tool for instruction and assessment. American Association of Physics Teachers, Ontario, February 2012.

J. Von Korff, D. Hu, and N. S. Rebello. Assessment of vertical transfer in problem solving: classifying construct validity threats. Physics Education Research Conference, Omaha, August 2011.

J. Von Korff, D. Hu, and N. S. Rebello. TAs' judgments about student problem solving difficulties. American Association of Physics Teachers, Omaha, August 2011.

CURRICULUM VITAE

RUILI WANG
Department of Physics and Astronomy
Georgia State University, Atlanta, GA 30303
404-413-6080 (office) 404-663-2415 (mobile)
rwang3@gsu.edu

EDUCATION:

Ph.D. Biophysics, Department of physics and Astronomy, GSU, GA, USA (01-2006)

MS Biophysics, Department of Physics and Astronomy, GSU, GA, USA (08-2003)

Physics, Department of Physics, Yunnan Normal University, Kunming, China (1987)

TEACHING EXPERIENCE:

At Georgia State University, GA USA

HON PHYS 2211K PRINCIPLE OF PHYSICS I
PHYS 2212K PRINCIPLE OF PHYSICS II
PHYS 2211K PRINCIPLE OF PHYSICS I
PHYS 1111K INTRODUCTORY PHYSICS I - *SCALE-UP* format
PHYS 1111K INTRODUCTORY PHYSICS I
PHYS 1112K INTRODUCTORY PHYSICS II - *SCALE-UP* format
PHYS 1112K INTRODUCTORY PHYSICS II

Physics Labs: 1111K, 1112K, 2211K, 2212K, 1111K Studio format
Infrared Spectroscopy section of Modern Physics Lab

At Emery & Henry College, VA USA

PHYS 201 General Physics I
PHYS 202 General Physics II
PHYS 311 Modern Physics
PHYS 361 Electronics Instrumentation
PHYS 421 Quantum Mechanics
PHYS 451 Advanced Laboratory

At Yunnan Normal University, Kunming, P.R. China

Undergraduate course: Introductory Physics, Modern Optics, Computer Programming
Introductory Physics and Modern Physics Lab

Graduate course: Laser Physics, Topics in Biophysics

Director and Supervisor of Physics Teaching Lab
Experiment Designer, Lab Manual Developer

PROFESSIONAL EXPERIENCE:

2012 - present Lecturer, Department of physics and Astronomy, GSU, Atlanta, GA

2010 - 2012 Visiting Assistant Professor, Department of Physics, Emory & Henry College, Emory, VA

2006 - 2010 Postdoctoral Research Associate, Department of physics and Astronomy, GSU, Atlanta, GA

1999 - 2000 Visiting Scientist, Department of Physics and Astronomy, GSU, Atlanta, GA

1992 - 1993 Visiting scholar, Optoelectronics Research Center, University of Southampton, Southampton, England

1984 - 1999 Assistant Professor, Associate Professor (1994) and Professor (2000), Department of Physics, Yunnan Normal University, Kunming, China

AWARDS and HONORS:

Outstanding Advanced Graduate Student Award (2005)

Outstanding Second Year Graduate Student Award (2003)

PHI BETA DELTA Honor Society for International Scholars

Molecular Basis of Disease program research fellowship at Georgia State University (2004-06)

International Study Scholarship of Yunnan Provincial Government (1991 in England)

International Study Foundation of Yunnan Provincial Government (1999 in the USA)

COMMITTEE SERVICE:

MS Thesis Committee (Monica Kristen Cook, Defense date: Monday, October 31st 2016)

Assessment Committee (Since Fall 2016)

Curriculum Committee (Since Fall 2013)

Visiting lecture Search Committee (Su2013)

Science Olympiad (Since Sp2014)

SACS-AAPT hosted by Georgia State University on April 10-11, 2015

RESEARCH GRANTS

- Hybrid pedagogy grant with collaborators Joshua Von Korff (PI), Brian Thoms, John Evans, Sumith Doluweera, Deepak Raghavan: $40,000, 01/2013-01/2015
- STEM mini grant "Workshop Physics in a SCALE-UP classroom to enhance a learning by doing environment: Course development", PI, $5,000, Spring 2014
- Theoretic calculations of infrared spectra for large biomolecules in photosynthetic reaction center together with the analysis and study of structure and function of the molecules, funded by National Natural Science Foundation of China, PI, 2008-2010

- The analysis of quantum and nonlinear science theory and its applications study for the effects of laser-induced biological variation, funded by National Natural Science Foundation of China, PI, 1997-2000
- The dynamic effects of laser microbeam and its application in plant breeding, funded by Natural Science Foundation of Science and Technology Commission of Yunnan Province, PI, 1997-2000
- A novel breeding method study of tobacco male sterility line cultivation using laser microbeam, funded by Natural Science Foundation of Science and Technology Commission of Yunnan Province, PI, 1996-1999
- The application study of laser microbeam in bioengineering, funded by Education Commission of Yunnan Province, PI, 1996-1998

CONFERENCE CONTRIBUTIONS

Oral Presentations:

- *5E Instructional Model in Studio Physics Class*, 2016 Annual Conference of Geoorgia Science Teachers Association, Atlanta Evergreen Marriott Conference Resort Stone Mountain, GA. Feb 4-6, (2016)
- *Density functional theory based calculations for the study of the vibrational properties of chlorophyll a*, 23rd Annual Eastern Regional Photosynthesis Conference, Woods Hole, MA (2006)
- *FTIR Difference Spectroscopy and Isotope Labeling for the Identification of the Carbonyl Modes of P700 in Photosystem I,* 20th Annual Eastern Regional Photosynthesis Conference, Woods Hole, MA (2003)
- *Optical Trapping and Manipulation of Microbes Using Laser Tweezers,* Colloquia at Georgia State University (2000)

Poster Presentations:

- *Rapid Identification of Apoptotic T-Cells Using Infrared Microscopy,* The 5th International Conference of Advanced Vibrational Spectroscopy, Melbourne, Australia (2009)
- *Density Functional Calculations for the Study of the effect of Axial Ligation of Chlorophyll-a in Photosystem I Reaction Center*, 34th Annual Midwest Southeast photosynthesis Meeting, Turkey Run State Park, Marshall, Indiana (2008)
- *Calculation of the Vibrational Properties of Chlorophyll-a,* 24th Annual Eastern Regional Photosynthesis Conference, Woods hole, MA (2007)
- *The molecular Details underlying Phylloquinone Function in Photosystem I,* 23rd Annual Eastern Regional Photosynthesis Conference, Woods hole, MA (2006)
- *Computational Study for the Histidine Modes in $P700^{+}$-P700 FTIR Difference Spectra*, 13th International Congress of Photosynthesis, Montreal, Canada (2004)

- *All $P700^+$-P700 FTIR Difference Spectra at 77K,* 22nd Annual Eastern Regional Photosynthesis Conference, Woods hole, MA (2005)
- *Histidine Modes in $P700^+$-P700 FTIR Difference Spectra,* 21st Annual Eastern Regional Photosynthesis Conference, Woods hole, MA (2004)
- *FTIR Difference Spectroscopy and Isotope Labeling for the Identification of the Carbonyl Modes of P700 in Photosystem I,* 20th Annual Eastern Regional Photosynthesis Conference, Woods Hole, MA (2003)

PUBLICATIONS since 2000:

- Hari Lamichhane, **Ruili Wang**, Gary Hastings (2011) *Comparison of calculated and experimental FTIR spectra of specifically labeled ubiquinones*, Vibrational Spectroscopy, 55, 279-286.
- Gary Hastings, Peter Krug, **Ruili Wang**, Jing Guo, Hari Lamichhane, Tian Tang, Yu-sheng Hsu, John Ward, David Katz and Julia Hilliard (2009) *Viral Infection of Cells in Culture Detected Using Infrared Microscopy*, Analyst, 134, 1462–1471.
- Sreeja Parameswaran, **Ruili Wang**, and Gary Hastings (2008) *Calculation of the Vibrational Properties of Chlorophyll-a in solution*, J. Phys Chem. *B.* 112, 14056-14062.
- Gary Hastings, **Ruili Wang**, Peter Krug, David Katz and Julia Hilliard (2008) *Infrared Microscopy For The Study of Biological Cell Monolayers*. *I*: Spectral Effects of Acetone and Formalin Fixation, Biopolymers 89, 11, 921-930.
- Gary Hastings and **Ruili Wang** (2008), *Vibrational Mode Frequency Calculations of Chlorophyll-d for Assessing ($P740^+$-P740) FTIR Difference Spectra Obtained Using Photosystem I Particles from Acaryochloris marina*, Photosynthesis Research, 95, 55-62.
- **Ruili Wang**, Sreeja Parameswaran and Gary Hastings (2007), *Density Functional Theory Based Calculations of the Vibrational Properties of Chlorophyll-a*, Vibrational Spectroscopy, 44, 357–368.
- K.M. Priyangika Bandaranayake, **Ruili Wang** T. Wade Johnson and Gary Hastings (2006), *Time-resolved FTIR Difference Spectroscopy for the Study of Photosystem I Particles with Plastoquinone-9 Occupying the A_1 Binding Site*, Biochemistry, 45(42) 12733-12740.
- K.M. Priyangika Bandaranayake, Velautham Sivakumar, **Ruili Wang** and Gary Hastings (2006), *Modeling the A_1 Binding Site in Photosystem I .Density Functional Theory for the Calculation of "Anion–Neutral" FTIR Difference Spectra of Phylloquinone*, Vibrational Spectroscopy. 42(1) 78-87.
- K.M. Priyangika Bandaranayake, **Ruili Wang** and Gary Hastings (2006), *Modification of the Phylloquinone in the A_1 Binding Site in Photosystem I Studied Using Time-resolved FTIR Difference Spectroscopy and Density Functional Theory*, Biochemistry 45(13), 4121-4127.
- Velautham Sivakumar, **Ruili Wang,** and Gary Hastings (2005), *A_1 Reduction in Intact Cyanobacterial Photosystem I Studies Using Time-resolved Step-scan Fourier Transform Infrared Difference Spectroscopy and Isotope Labeling,* Biochem. 44(6), 1880-1893.

- **Ruili Wang,** Velautham Sivakumar, T. Wade Johnson and Gary Hastings (2004), *FTIR Difference Spectroscopy In Combination With Isotope Labeling for Identification of The Carbonyl Modes of P700 and $P700^+$ in Photosystem I,* Biophys. J. 86, 1061-1073.
- **Ruili Wang** and Gary Hastings (2004), *Computed Infrared Spectra of Protonated and Metal-Bound 4-Methylimidazole*, Photosynthesis: Fundamental Aspects to Global Perspectives, A. van der Est and D. Bruce Eds, Proceedings 13th International Congress on Photosynthesis, Montreal, Canada, Vol.1, 70-72.
- Yajing Li, Marie-Gabrielle Lucas, Tanya Konovalova, Brian Abbott, Fraser MacMillan, Alexander Petrenko, Velautham Sivakumar, **Ruili Wang,** Gary Hastings, Feifei Gu, Johan van Tol, Louis-Claude Brunel, Russell Timkovich, Fabrice Rappaport, Kevin Redding (2004), *Mutation of the Putative Hydrogen-bond Donor to P700 of Photosystem I,* Biochem. , 43(39), 12634-12647.
- Velautham Sivakumar, **Ruili Wang** and Gary Hastings (2004), *A_1 Reduction in Intact Cyanobacterial Photosystem I Studied Using Time-resolved Step-scan Fourier Transform Infra-red Difference Spectroscopy in Combination With Site Directed Mutagenesis and Quinone Exchange Experiments*, Photosynthesis: Fundamental Aspects to Global Perspectives, A. van der Est and D. Bruce Eds, Proceedings, 13th International Congress on Photosynthesis, Montreal, Canada, Vol.1, 59-61.
- **Ruili Wang,** Velautham Sivakumar, Yajing Li, Kevin Redding and Gary Hastings (2003), *Mutation Induced Modulation of Hydrogen Bonding To P700 Studied Using FTIR Difference Spectroscopy,* Biochem. 42(33), 9889-9897.
- Sivakumar, V., **Wang, R.** and Hastings, G. (2003), *Photo-Oxidation of P740, the Primary Electron Donor in Photosystem I From Acaryochloris marina*. *Biophys. J.* 85, 3162-3172.
- Hastings, G., Ramesh, V. M., **Wang, R**., Sivakumar, V. and Webber, A. (2001), *Primary Donor Photo-Oxidation in Photosystem I: A Re-Evaluation of ($P700^+$-P700) Fourier Transform Infrared Difference Spectra,* Biochem. 40(43), 12943-12949.
- HU Qiong, WANG Guo-Ying, OU Jia-Ming and **Wang Rui-Li** (2010), *Effect of Water Ligation on the Redox Potential and Infrared Spectra of Chlorophyll-a,* Acta Phys. -Chim. Sin., 26(11), 3035-3040.
- Wang Guo-ying, Hu Qiong, Liu Gang, Ou Jia-ming and **Wang Rui-li** (2010), *Density Functional Theory for the study of Ionization Energies and Infrared spectra of Methionine,* Infrared, Vol. 31(10), 21-25.
- Hu Qiong, Wang Guo-ying Liu Gang Ou Jia-ming and **Wang Ruili** (2010), *Ionization Energies and Infrared spectra Studies of Histidine Using Density Functional Theory,* Spectroscopy and Spectral Analysis, Vol. 30(5), 1192-1197.
- Hu Qiong, Wang Guo-ying, Ou Jia-ming and **Wang Ruili** (2010), *Calculation of Vibrational Spectral Properties of Four Protonation Forms of Histidine Using Density Functional Theory,* Infrared, Vol. 31(2), 19-24.
- **Wang Ruili**, et al, (2000), *Optical Trapping and Manipulation of Microbe Using Laser Tweezers,* Chinese Laser, Vol. A27, 921-925.

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Research Interests

Star and Planet Formation
Stellar Evolution
High Dispersion Spectroscopy
Extrasolar Planets
Binary Stars and Star Clusters
Interferometry

Employment

Associate Professor — ***August 2013 - Present***
Georgia State University

Assistant Professor — ***August 2008 - August 2013***
Georgia State University

Assistant Professor — ***January 2006 - August 2008***
University of Alabama in Huntsville

Postdoctoral Scholar — ***June 2002 - December 2005***
California Institute of Technology
Sponsor: Dr. Lynne A. Hillenbrand

Harlan J. Smith Postdoctoral Fellow — ***November 1999 - June 2002***
University of Texas, Austin
Sponsor: Dr. Tom Barnes

Education

Ph.D., Astronomy — ***November 1999***
University of California, Los Angeles
Adviser: Dr. Andrea M. Ghez

M. S., Astronomy — ***December 1995***
University of California, Los Angeles

B. S., Astronomy — ***June 1993***
The Ohio State University
Magna cum laude, with distinction

Grants Awarded (as P.I.)

2015 NSF Astronomy & Astrophysics Grant ($381,263 awarded, 3 years)
"The Ages of Nearby A-Type Stars"
2011 NASA Origins of Solar Systems Grant ($122,241 awarded, 2 years)
"A Search for Planets in the Metal Rich Open Cluster Praesepe"
2010 NSF Astronomy & Astrophysics Grant ($332,431 awarded, 3 years)
"The Exoplanet Frontiers: A Star Ages and M Star Planets"

Grants Awarded (con't)

2010 NASA/Keck Principle Investigator Data Analysis Fund ($13,500 awarded)
"Do the Smallest Stars Really Have Planets?"
2009 GSU Research Initiation Grant ($9,950 awarded)
"A Search for Planets Orbiting Our Nearest Stellar Neighbors"
2007 NSF Astronomy & Astrophysics Grant ($148,380 awarded; 2 years)
"An Infrared Radial Velocity Search for Young Planets"
2006 NASA/Keck Principle Investigator Data Analysis Fund ($20,600 awarded)
"The Search for Young Planets"
2006 UAH Minigrant ($9,814 awarded)
"A Test of Brown Dwarf Formation Theories"
2003 Hubble Space Telescope, Cycle 12 General Observer, ($128,000 awarded)
"A Search for Young Binary Brown Dwarfs: Constraining Formation Scenarios and Masses Through Multiplicity"

Student Grants (acting P.I.)

2013 NSF Graduate Student Research Fellowship ($42,000 per year, up to 3 yr)
"Finding New Worlds in New Environments", Mr. Samuel Quinn
2012 NSF Graduate Student Research Fellowship ($42,000 per year, up to 3 yr)
"Finding Nearby Young Planets: A New Approach", Ms. Nicole Cabrera
2010 NSF Graduate Student Research Fellowship ($40,500 per year, up to 3 yr)
"CAESAR: a Companion Assessment of Equatorial Stars with Astrometry and Radial Velocities", Ms. Cassy Davison

Teaching Experience

	Student level:
"Seminar in Astronomy" (GSU)	*undergraduate*
"Stellar and Galactic Astronomy" (x7, GSU)	*undergraduate*
"Astronomy of the Solar System" (x8, GSU)	*undergraduate*
"Stellar Structure and Evolution" (x3, GSU)	*graduate*
"Observational Astrophysics" (UAH)	*graduate*
"General Physics II" (x2; UAH)	*undergraduate*
"General Physics I" (x2; UAH)	*undergraduate*
"Conceptual Physics" (UAH)	*undergraduate*

Graduate Student Advisement

	Degree Conferred:
Mr. Robert D. Moore, M.S.	***2012***
Mr. James R. Parks, Ph.D.	***2014***
Ms. Cassy Smith (Davison), Ph.D.	***2015***
Mr. Samuel N. Quinn, Ph.D.	***2016***
Mr. Jeremy Jones, Ph.D.	***2016***
Ms. Nicole Cabrera, Ph.D.	***2016***
Mr. Justin Cantrell, Ph.D.	*estimated 2017*

Honors & Awards

Commencement Speaker, Labrae High School (Leavittsburg, OH)	***2012***
UAH, Lecture Demonstration, "People's Choice Award"	***2006***
UT Austin, Harlan J. Smith Postdoctoral Fellowship	***1999 - 2002***
Carnegie DTM, Postdoctoral Fellowship (declined)	***1999***
UC Berkeley, President's Postdoctoral Fellowship (declined)	***1999***

University Service	Physics & Astronomy Space, Planning and Development Comm.	***2014 - present***
	Physics & Astronomy Colloquium Committee, *Chair*	***2013 - present***
	William H. Nelson Lecture Series Committee, *Chair*	***2013 - present***
	University Senate, Committee on Planning and Development	***2012 - present***
	University Senate, Committee on Faculty Affairs	***2012 - present***
	Faculty Affairs Subcommittee on Human Resources, *Chair*	***2014 - present***
	2nd Century Initiative Doctoral Fellowship Committee	***2012 - present***
	Physics & Astronomy Graduate Admissions Committee	***2008 - present***
	Physics & Astronomy Examination Committee	***2008 - present***
	2nd Century Initiative Proposal Committee (Astronomy)	***2010 - 2014***
	Director, Hard Labor Creek Observatory	***2010 - 2015***
	Physics & Astronomy Department Website Committee	***2011 - 2013***
	GSU Physics & Astronomy Curriculum Assessment Committee	***2009 - 2013***
	GSU Astronomy Club, Faculty Adviser	***2012 - 2013***
	UAH Barry M. Goldwater Scholarship Nomination Committee	***2008***
	UAH Honors Council	***2007 - 2008***
	UAH Physics Department Graduate Committee	***2006 - 2008***

Astronomical Service	Co-Chair, *Workshop on Solar & Stellar Astronomy Big Data* (SABID'16; Washington, DC)	***2016***
	NSF Graduate Research Fellowship, Review Panel	***2016***
	Co-Chair, *IAU Symposium 314: Young Stars and Planets Near the Sun* (Atlanta, GA)	***2015***
	Kepler Participating Scientists Program, Panel Review	***2013***
	NASA's IRTF, Time Allocation Committee (4 semesters)	***2007 - 2009***
	NSF Review Panel, Astronomy & Astrophysics Grants	***2008***
	Cycle 4 Spitzer Space Telescope, Time Allocation Committee	***2007***
	Spitzer Postdoctoral Fellowship Committee	***2005***
	Palomar/Keck, Time Allocation Committee (Caltech)	***2003***

Refereed Publications

"First Images of Cool Starspots On a Star Other Than the Sun: Interferometric Imaging of λ Andromeda"
Parks, J. R., White, R. J., Baron, F., Monnier, J. D., Kloppenborg, B., Henry, G., Schaefer, G., Che, X., Pedretti, E., Thureau, N., Zhao, M., ten Brummelaar, T., McAlister, H., Ridgway, S. T., Turner, N., Sturmann, J. & Sturmann, L. 2017, ApJ, submitted

"RV Variability and Stellar Properties of FGK Stars in the Cores of NGC 2516 and NGC 2422"
Bailey, J. I., III, Mateo, M., White, R. J., Shectman, S. A., Crane, J. D., Olszewski, E. W. 2017, MNRAS, submitted

"Obliquities of Exoplanet Host Stars From Precise Distances and Stellar Angular Diameters"
Quinn, S. N. & White, R. J. 2016, ApJ, 833, 173

"Retrieval of Precise Radial Velocities from Near-Infrared High-Resolution Spectra of Low-mass Stars"
Gao, P., Plavchan, P., Gagne, J., Furlan, E., Bottom, M., Anglada-Escude, G., White, R., Davison, C. L., Beichman, C., Brinkworth, C., Johnson, J., Ciardi, D., Wallace, K., Mennesson, B., von Braun, K., Vasisht, G., Prato, L., Kane, S. R., Tanner, A., Crawford, T. J., Latham, D., Rougeot, R., Geneser, C. S., Catanzarite, J. 2016, PASP, 128, 4501

"***The Age of the Directly Imaged Planet Host Star κ Andromeda Determined from Interferometric Observations"***
Jones, J., White, R. J., Quinn, S., Ireland, M., Boyajian, T., Schaefer, G., Baines, E. K. 2016, ApJ, 822, 3

"Multiplexing Precision RVs: Searching for Close-in Gas Giants in Open Clusters"
Bailey, J. I., III, Mateo, M., White, R. J., Shectman, S. A., Crane, J. D., Olszewski, E. W. 2016, AJ, 152, 9

"A High-precision Near-infrared Survey for Radial Velocity Variable Low-mass Stars Using CSHELL and a Methane Gas Cell"
Gagné, J., Plavchan, P., Gao, P., Anglada-Escude, G., Furlan, E., Davison, C., Tanner, A., Henry, T. J., Riedel, A. R., Brinkworth, C., Latham, D., Bottom, M., White, R., Mills, S., Beichman, C., Johnson, J., A., Ciardi, D. R., Wallace, K., Mennesson, B., von Braun, K., Vasisht, G., Prato, L., Kane, S. R., Mamajek, E. E., Walp, B., Crawford, T. J., Rougeot, R., Geneser, C. S., Catanzarite, J. 2016, ApJ, 822, 40

"The GAPS Programme With HARPS-N at TNG XI. Pr0211 in M44: the first Multi-Planet System in an Open Cluster"
Malavolta, L., et al. (48 coauthors - Quinn [#4], White [#15]), 2016, A&A, 588, 118

"The Ages of A-Stars. I. Interferometric Observations and Age Estimates for Stars in the Ursa Major Moving Group"
Jones, J., White, R. J., Boyajian, T., Schaefer, G., Baines, E., Ireland, M., Patience, J., ten Brummelaar, T., McAlister, H., Ridgway, S. T., Sturmann, J., Sturmann, L., Turner, N., Farrington, C. & Goldfinger, P. J. 2015, ApJ, 813, 58

"A 3D Search for Companions to 12 Nearby M-Dwarfs"
Davison, C. L., White, R. J., Henry, T. J., Riedel, A. R., Jao, W., Bailey, J. I., III, Quinn, S. N., Cantrell, J. R., Subasavage, J. P., Winters, J. G. 2015, AJ, 149, 106

"HD 285507b: An Eccentric Hot Jupiter in the Hyades Open Cluster"
Quinn, S. N., White, R. J., Latham, D. W., Buchhave, L. A., Torres, G., Stefanik, R. P., Berlind, P., Bieryla, A., Calkins, M. C., Esquerdo, G. A., Fürész, G., Geary, J. C., Szentgyorgyi, A. H. 2014, ApJ, 787, 27

"The Solar Neighborhood. XXXIII. Parallax Results from the CTIOPI 0.9m Program: Trigonometric Parallaxes of Nearby Low-Mass Active and Young Systems"
Riedel, Adric R., Finch, Charlie T., Henry, Todd J., Subasavage, John P., Jao, Wei-Chun, Malo, Lison, Rodriguez, David R., White, Russel J., Gies, Douglas R., Dieterich, Sergio B., Winters, Jennifer G., Davison, Cassy L., Nelan, Edmund P., Blunt, Sarah C., Cruz, Kelle L., Rice, Emily L., Ianna, Philip A. 2013, AJ, accepted

"Periodic and Aperoidic Variability in the Molecular Cloud rho Ophiuchus"
Parks, J. R., Plavchan, P., White, R. J., Gee, A. H. 2013, ApJS, 211, 3

"The Closest M-dwarf Quadruple System to the Sun"
Davison, C. L., White, R. J., Jao, W.-C., Henry, T. J., Bailey, J. I., III, Quinn, S. N., Cantrell, J. R., Riedel, A. R., Subasavage, J. P., Winters, J. G., Crockett, C. J. 2014, AJ, 147, 26

"The Solar Neighborhood XXIX: The Habitable Real Estate of Our Nearest Stellar Neighbors"
Cantrell, Justin R., Henry, Todd J., White, Russel J. 2013, AJ, 146, 99

"Stellar Diameters and Temperatures. III. Main-sequence A, F, G, and K Stars: Additional High-precision Measurements and Empirical Relations"
Boyajian, Tabetha S., von Braun, Kaspar, van Belle, Gerard, Farrington, Chris, Schaefer, Gail, Jones, Jeremy, White, Russel, McAlister, Harold A., ten Brummelaar, Theo A., Ridgway, Stephen, Gies, Douglas, Sturmann, Laszlo, Sturmann, Judit, Turner, Nils H., Goldfinger, P. J., Vargas, Norm, 2013, ApJ, 771, 40

"Precise Infrared Radial Velocities from Keck/NIRSPEC and the Search for Young Planets"
Bailey, J. I., III., White, R. J., Blake, C. H., Charbonneau, D., Barman, T. S., Tanner, A. M., Torres, G. 2012, ApJ, 749, 16

"The Sizes of the Nearest Young Stars"
McCarthy, K. & White, R. J. 2012, AJ, 143, 134

"Stellar Diameters and Temperatures I. Main Sequence A, F, & G Stars"
Boyajian, T. S., McAlister, H. A., van Belle, G., Gies, D. R., ten Brummelaar, T. A., von Braun, K., Farrington, C., Goldfinger, P. J., O'Brien, D., Parks, R. J., Richardson, N. D., Ridgway, S., Schaefer, G., Sturmann, L., Sturmann J, Touhami, Y., Turner, N. H. & White, R. J. 2012, ApJ, 746, 101

"A Correlation Between Circumstellar Disks and Rotation in the Upper Scorpius OB Association"
Dahm, S. E., Slesnick, C. L. & White, R. J. 2012, ApJ, 745, 56

“55 Cancri: Stellar Astrophysical Parameters, a Planet in the Habitable Zone, and Implications for the Radius of a Transiting Super-Earth”
von Braun, K., Boyajian, T. S., ten Brummelaar, T. A., Kane, S. R., van Belle, G. T., Ciardi, D. R., Raymond, S. N., López-Morales, M., McAlister, H. A., Schaefer, G., Ridgway, S. T., Sturmann, L., Sturmann, J., White, R., Turner, N. H., Farrington, C., Goldfinger, P. J. 2011, ApJ, 740, 49

“The NIRSPEC Ultracool Dwarf Radial Velocity Survey”
Blake, C. H., Charbonneau, D. & White, R. J. 2010, ApJ, 723, 684

“A Survey of Stellar Families: Multiplicity of Solar-type Stars”
Raghavan, D, McAlister, H. A.; Henry, T. J., Latham, D. W.; Marcy, G. W., Mason, B. D., Gies, D. R., White, R. J. & ten Brummelaar, T. A. 2010, ApJS, 190, 1

“High-precision Dynamical Masses of Very Low Mass Binaries”
Konopacky, Q. M., Ghez, A. M., Barman, T. S., Rice, E. L., Bailey, J. I., White, R. J., McLean, I. S. & Duchêne, G. 2010, ApJ, 711, 1087

“A Millimeter-wave Interferometric Study of Dust and CO Disks Around Late Spectral Type Stars in Taurus-Auriga”
Schaefer, G. H., Dutrey, A., Guilloteau, S., Simon, M. & White, R. J., 2009, ApJ, 701, 698

“T-Lyr1-17236: A Long-Period Low-Mass Eclipsing Binary”
Devor, J., Charbonneau, D., Torres, G., Blake, C. H., White, R. J., Rabus, M., O'Donovan, F. T., Mandushev, G., Bakos, G. Á., Fűrész, G. & Szentgyorgyi, A. 2008, ApJ, 687, 1253

“A Spectroscopic Binary at the M/L Transition”
Blake, C. H., Charbonneau, D., White, R. J., Torres, G., Marley, M. S., Saumon, D. 2008, ApJ, 678, 125

"Near-Infrared Interferometric, Spectroscopic, and Photometric Monitoring of T Tauri Inner Disks"
Eisner, J. A., Hillenbrand, L. A., White, R. J., Bloom, J. S., Akeson, R. L. & Blake, C. H. 2007, ApJ, 669, 1072

"Multi-epoch Radial Velocity Observations of L Dwarfs"
Blake, C. H., Charbonneau, D., White, R. J., Marley, M. S. & Saumon, D. 2007, ApJ, 666, 1198

"High Dispersion Optical Spectra of Nearby Stars Younger Than the Sun"
White, R. J., Gabor, J. M. & Hillenbrand, L. A. 2007, AJ, 133, 2524

"The Stellar Properties of Embedded Protostars"
White, R. J., Greene, T. P., Doppmann, G., Kovey, K. & Hillenbrand, L. A. 2007, in Protostars and Planets V, University of Arizona Press, Tucson, p. 117-132

"The Formation of Brown Dwarfs: Observations"
Luhman, K. L., Joergens, V., Lada, C., Muzerolle, J., Pascucci, I. & White, R. J., 2007, in Protostars and Planets V, University of Arizona Press, Tucson, p. 443-457

"Dynamical Mass Measurements of Pre-Main-Sequence Stars: Fundamental Tests of the Physics of Young Stars"
Mathieu, R. D., Baraffe, I., Simon, M., Stassun, K. G. & White, R. J. 2007, in Protostars and Planets V, University of Arizona Press, Tucson, p. 411-425

"Multiplicity and Optical Excess Across the Substellar Boundary in Taurus"
Kraus, A. L., White, R. J. & Hillenbrand, L. A. 2006, ApJ, 649, 306

"Multiplicity at the Stellar/Substellar Boundary in Upper Scorpius"
Kraus, A. L., White, R. J. & Hillenbrand, L. A. 2005, ApJ, 633, 452

"Observations of T Tauri Disks at Sub-AU Radii: Implications for Magnetospheric Accretion and Planet Formation"
Eisner, J. A., Hillenbrand, L. A., White, R. J., Akeson, R. L. & Sargent, A. I. 2005, ApJ, 623, 952

"A Long-Lived Accretion Disk Around a Lithium Depleted Binary T Tauri Star"
White, R. J., & Hillenbrand, L. A. 2005, ApJ, 621L, 65

"The Challenge of Wide-Field Transit Surveys: The Case of GSC 01944-02289"
Mandushev, G., Torres, G., Latham, D. W., Charbonneau, D., Stefanik, R. P., Alonso, R., White, R. J., Dunham, E. W., Brown, T. M. & O'Donovan, F. T. 2005, ApJ, 621, 1061

"Forbidden Line Emission in the Eccentric Spectroscopic Binaries DQ Tauri and UZ Tauri E Monitored over an Orbital Period"
Huerta, M., Hartigan, P., White, R. J. 2005, AJ, 129, 985

"On the Evolutionary Status of Class I Stars and Herbig-Haro Energy Sources in Taurus-Auriga"
White, R. J., & Hillenbrand, L. A. 2004, ApJ, 616, 998

"An Assessment of Dynamical Mass Constraints on Pre-Main Sequence Evolutionary Tracks"
Hillenbrand, L. A. & White, R. J. 2004, ApJ, 604, 741

“Stellar Properties of Pre-Main Sequence Stars from High Resolution Near-IR Spectroscopy”
Doppmann, G. W., Jaffe, D. T. & White, R. J. 2003, AJ, 126, 3043

“Very Low Mass Stars and Brown Dwarfs in Taurus-Auriga”
White, R. J. & Basri, G. 2003, ApJ, 582, 1102

"Adaptive Optics Observations of Vega: Eight Detected Sources and Upper Limits to Planetary-Mass Companions"
Metchev, S. A., Hillenbrand, L. A. & White, R. J. 2003, ApJ, 582, 1109

"Stellar Companions to Stars with Planets"
Patience, J., White, R. J., Ghez, A. M. et al. 2002, ApJ, 581, 654

"Preliminary Orbits and System Masses for Five Binary T Tauri Stars"
Tamazian, V. S., Docobo, J. A., White, R. J., Woitas, J. 2002, ApJ, 578, 925

"Observational Constraints on the Formation and Evolution of Binary Stars"
White, R. J. & Ghez, A. M., 2001, ApJ, 556, 265

"A Test of PMS Evolutionary Models Across the Stellar/Substellar Boundary Based on Spectra of the Young Quadruple GG Tau"
White, R. J., Ghez, A. M., Reid, I. N. and Schultz, G. 1999, ApJ, 520, 811

"Discovery of Seven T Tauri Stars and a Brown Dwarf Candidate in the Nearby TW Hydrae Association"
Webb, R. A., Zuckerman, B., Platais, I., Patience, J., White, R. J., Schwartz, M. J. and McCarthy, C. 1999, ApJ, 512, L63

"A Proto-Cometary Cloud Around HR 4796A?"
Jura, M., Malkan, M., White, R. J., Telesco, C., Pina, R. & Fisher, R. S. 1998, ApJ, 505, 897

"High Spatial Resolution Imaging of PMS Binary Stars: Resolving the Relationship Between Disks and Close Companions"
Ghez, A. M., White, R. J. & Simon, M. 1997, ApJ, 490, 353

"HDE 233517: Lithium and Excess Infrared Emission in Giant Stars"
Fekel, F. C., Webb, R. A., White, R. J. & Zuckerman, B. 1996, ApJ Letters, 462, L95
"Steps Toward Determination of the Size and Structure of the Broad-Line Region Active Galactic Nuclei. VIII. An Intensive HST, IUE, and Ground Based Study of NGC 5548" (216)
Korista, K. T., et al. 1996, ApJS, 97, 285

"The Fate of the Solid Matter Orbiting HR 4796A"
Jura, M., Ghez, A. M., White, R. J., McCarthy, D. W., Smith, R. C. & Martin, P. G. 1995, ApJ, 445, 451

"Comments on Cross-Correlation Methodology in Variability Studies of Active Galactic Nuclei"
White, R. J. and Peterson, B. M. 1994, PASP, 106, 879

"Steps Toward Determination of the Size and Structure of the Broad-Line Region Active Galactic Nuclei. VII. Variability of the Optical Spectrum of NGC 5548 Over 4 Years"
Peterson, B. M., et al. 1994, ApJ, 425, 622

"Steps Toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. V. Variability of the Ultraviolet Continuum and Emission Lines of NGC 3783"
Reichert, G. A., et al. 1994, ApJ, 425, 582

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EDUCATION:

Ph.D. – Teaching & Learning (Sci. Ed.) – Georgia State University – Jan. 2004.
M.S. - Astronomy - Vanderbilt University – 1981.
Teacher Certification, Southeast Missouri State University – 1978.
B.S. - Physics - Southeast Missouri State University – 1974.

WORK EXPERIENCE:

Department of Physics and Astronomy Georgia State University Atlanta, GA 30303	Senior Academic Professional July 2015 – present.
Department of Physics and Astronomy Georgia State University Atlanta, GA 30303	Academic Professional July 2010 – 2015.
Department of Physics and Astronomy Georgia State University Atlanta, GA 30303	Laboratory Coordinator June 2005 - 2010.
Department of Biological & Physical Sci. Kennesaw State University Kennesaw, GA 30144	Temporary Assistant Professor of Science Education Aug. 2004-May 2005.
Department of Physics and Astronomy Georgia State University Atlanta, GA 30303	Laboratory Coordinator 1986—2004, Program Coordinator 1982-1986, Administrative Specialist 1981-1982.
Department of Physics and Astronomy Vanderbilt University Nashville, TN	Dyer Observatory Assistant 1980-1981 Graduate Teaching Assistant 1979-1980.

Kelly High School Benton, MO	9th Grade Science and Math Teacher, 1977/78.
Southeast Missouri Hospital Cape Girardeau, MO	Radiation Therapy Assistant 1976-1977.
Department of Physics Southeast Missouri State University Cape Girardeau, MO	Graduate Teaching Assistant 1975-1976.
McDonald Observatory University of Texas Fort Davis, TX	Assistant Observer 1974-1975.

MEMBERSHIPS:

Astronomical Society of the Pacific (ASP)
National Science Teachers Association (NSTA)

PUBLICATIONS

THESIS & PUBLISHED PAPERS:

21) *Astrometric Observations of WDS Neglected Binary Stars*, S. J. Williams. J. W. Wilson, M. Hursey, and S. M. Caballero-Nieves, JOURNAL OF DOUBLE STAR OBSERVATIONS, 6, 15-20, (2010).

20) *Science Teachers Learning About the Nature of Science and Scientific Inquiry by Doing Astronomical Research: The Binary Star Project.* John W. Wilson, Ph.D. DISSERTATION, Georgia State University, Atlanta, GA, (2003).

19) *Multi-Epoch Multiwavelength Spectra and Models for Blazar 3C 279,* R. C. Hartman et al. (including J. W. Wilson) ASTROPHYSICAL JOURNAL, 553, 2, (2001).

18) *Evidence of Rapid Optical Variability in Selected Narrow-Line Seyfert 1 Galaxies,* H.R. Miller, E.C. Ferrara, J.P McFarland, J.W. Wilson, A.B. Daya, and R.E. Fried, NEW ASTRONOMICAL REVIEW, 44, 539-543 (2000).

17) *The Microvariability of Selected AGN's in 1998-1999*, H.R. Miller, E.C. Ferrara, A.B. Daya, J.W. Wilson, R.E. Fried, J.C. Noble, and M. Jang, BLAZAR MONITORING TOWARD THE THIRD MILLENIUM, Ed. by C.M. Rateri, M Villata, and L.O. Takalo, Observatorio Astronomico di Torino, 20-24, (1999).

16) *The Character of the Microvariability of Three TeV Blazars*, H.R. Miller, A.B. Daya, E.C. Ferrara, J.W. Wilson, J.C. Noble, M.T. Carini, M. Jang, and R.E. Fried, BL LAC PHENOMENON, Ed. by L.O. Takalo and A. Sillanpaa, ASTRONOMICAL SOCIETY OF THE PACIFIC CONFERENCE SERIES, 159, 75, (1999).

15) *The Microvariability of BL Lac During the 1997 Outburst*, H.R. Miller, A. D. Nair, L.C. Roberts, E.C. Ferrara, L.A. Benson, J.W. Wilson, R.E. Fried, S.L. Clements, M.T. Carini, J.C. Noble, and M. Jang, OJ-94 Conference, Ed. by G. Tosti and L. Takalo, PERUGIA UNIVERSITY OBSERVATORY PROCEEDINGS, **3**, 184, (1998).

14) *ICCD Speckle Observations of Binary Stars, XVII. Measurements During 1993-1995 from the Mount Wilson 2.5-m Telescope*, W.I. Hartkopf, H.A. McAlister, B.D. Mason, T. ten Brummelaar, L.C. Roberts, N.H. Turner, and J.W. Wilson, ASTRONOMICAL JOURNAL, 114, 4, (1997).

13) *All-Sky Stromgren Photometry of Speckle Binaries*, J.R. Sowell and J.W. Wilson, PUBLICATIONS OF THE ASTRONOMICAL SOCIETY OF THE PACIFIC, 105, 36, (1993).

12) *A Study of the Eclipsing Cataclysmic Variable Lanning 90*, P.M. Garnovich, P. Szhody, M.L. Mateo, L.J. Feinswog, J. Booth, B. Goodrich, H.R. Miller, M.T. Carini and J.W. Wilson, ASTROPHYSICAL JOURNAL, 365, 696, (1990).

11) *The Optical Variability of Arakelian 120, 1977-1987*, J.W. Wilson, H.R. Miller and M.T. Carini, PROCEEDINGS OF ACTIVE GALACTIC NUCLEI CONFERENCE AT GEORGIA STATE UNIVERSITY, 1987, edited by H.R. Miller and P.J. Wiita, 307, 173, (1988).

10) *A Photometric Investigation of the Optical Variability of Markarian 501*, B.Q. McGimsey, H.R. Miller, M.T. Carini and J.W. Wilson, PROCEEDINGS OF ACTIVE GALACTIC NUCLEI CONFERENCE AT GEORGIA STATE UNIVERSITY, 1987, edited by H.R. Miller and P.J. Wiita, 307, 170, (1988).

9) *The Long-Term Optical Variability of PKS 2201+044*, M.T. Carini, H.R. Miller and J.W. Wilson, PROCEEDINGS OF ACTIVE GALACTIC NUCLEI CONFERENCE AT GEORGIA STATE UNIVERSITY, 1987, edited by H.R. Miller and P.J. Wiita, 307, 166, (1988).

8) *CG Cygni: Solutions of 1979 and 1980 Light Curves*, J.R. Sowell, J.W. Wilson, D.S. Hall and P.E. Peyman, PUBLICATIONS OF THE ASTRONOMICAL SOCIETY OF THE PACIFIC, 99, 407, (1987).

7) *Photoelectric Photometry of Six Cataclysmic Variable Stars*, J.W. Wilson, H.R. Miller, J.L. Africano, B.D. Goodrich, C.T. Mahaffey and R.L. Quigley, ASTRONOMY AND ASTROPHYSICS SUPPLEMENT SERIES, 66, 323, (1986).

6) *Astrometric Observations of Pluto: 1965 - 1981*, R.H. Hardie, R L. Marcialis, J.W. Wilson and W.R. Furman, THE ASTRONOMICAL JOURNAL, 90, (12), 2643, (1985).

5) *Photoelectric Comparison Sequences in the Fields of B2 1308+326 and 1418+54* H.R. Miller, J.W. Wilson, J.L. Africano and R.J. Quigley, ASTRONOMY AND ASTROPHYSICS SUPPLEMENT SERIES, 57, 353, (1984).

4) *SS Bootis: A Totally Eclipsing Binary of the RS CVn Type*, J.W. Wilson, D.S. Hall, G.W. Henry, C.A. Vaucher and J.L. Africano, THE ASTRONOMICAL JOURNAL, 88, (8), 1257, (1983).

3) *RY Geminorium: An Algol Binary with Moderate Circumstellar Emission*, D.S. Hall, J.A. Eaton, J.W. Wilson and Tillman Stuhlinger, ACTA ASTRONOMICA, 32, 411, (1982).

2) *Differential UBV Photometry and Light Curve Solutions of the RS Canum Venaticorum Binaries SS Bootis and RW Ursae Majoris*, John W. Wilson, M.S. THESIS, Vanderbilt University, Nashville, TN, (1981).

1) *On the Possibility of Apsidal Motion in UX Ursae Majoris*, J.L. Africano and J.W. Wilson, PUBLICATIONS OF THE ASTRONOMICAL SOCIETY OF THE PACIFIC, 88, 8, (1976).

PAPERS PRESENTED AT PROFESSIONAL MEETINGS:

25) *Including Hands.On Instruction in a Science Lecture Course for Undergraduate Education Majors: Lessons Learned,* Rachel Fiore, Ben McGimsey, John Wilson. Presented to National Science Teachers Association National Conference. Nashville, TN. April 1, 2016.

24) *Including Lab in Traditional Lecture Classes.* John W. Wilson, Ben Q McGimsey, Rachel S. Fiore. Presented to Southern Atlantic Coast Section American Association of Physics Teachers, Atlanta, GA. April 11, 2015.

23) *Effects of Embedding Nature of Science Concepts in a College Level Physical Science Course.* Lisa Martin-Hansen and John Wilson. Presented to National Association of Research in Science Teaching, Baltimore, MD. March 30-April 2, 2008.

22) *Training Science Teachers and Students to Observe Cosmic Ray Muons.* John Wilson, Xiaochun He, and Carola Butler. Presented to Association for Science Teacher Education, St. Louis, MO. January 10-12, 2008.

21)*Effects of Active Learning Strategies in a College Astronomy Course.* Lisa Martin-Hansen and John Wilson. Presented to Southeastern Association for Science Teacher Education, Valdosta State University, Valdosta, GA. October 27, 2007.

20) *Training Science Teachers to Perform Cosmic Ray Muon Observations: An Immersion into Scientific Inquiry.* John W. Wilson and Xiaochun He. Presented to Southeastern Association for Science Teacher Education, Valdosta State University, Valdosta, GA. October 27, 2007.

19) *Examining Teaching in College Astronomy: Active Learning and Traditional Teaching Practices.* Lisa Martin-Hansen and John Wilson. Presented to North Central-Association of Science Teacher Education, Madison, WI. October 10-12, 2007.

18) *Development of Nature of Science and Scientific inquiry Activities for Science Education Students Enrolled in a Science Course.* John Wilson and Lisa Martin-Hansen. Presented to Prism Regional Institute Metro Atlanta Region, Timber Ridge Conference Center, Mableton, GA. April 29-30, 2007.

17) *DEVELOPMENT OF OBSERVATIONAL ACTIVITES FOR INTRODUCTORY LEVEL ASTRONOMY LABORATORY STUDENTS.* Kevin Marshall and John W. Wilson, Poster presented to American Astronomical Society 209th Meeting, Seattle, WA. January 7-10, 2007.

16) *Physical Science from a Historical Perspective: Teaching Nature of Science in a Science Content Course for Pre-Service Teachers.* John W. Wilson, Lisa Martin-Hansen, and Joe Cox. Presented to Southeastern Association for Science Teacher Education 2005, Mercer University, Macon, GA. Oct. 7, 2006.

15) *Physicists Collaborating with Science Teachers and Students to Investigate Cosmic Rays.* John W. Wilson, Xiaochun He, and the GSU Cosmic Ray Team. Presented to Southeastern Association for Science Teacher Education 2005, University of Georgia, Athens, GA. Oct. 22, 2004.

14) Collabo*rations between Physicists and Science Students to Investigate Cosmic Rays.* John W. Wilson et al. Presented to the Southeastern Association of Educators of Teachers of Science Annual Meeting 2004, University of Florida, Gainesville, FL Oct. 23, 2004.

13) *Teachers doing Binary Star Observations for the United States Naval Observatory.* John W. Wilson. Presented to the American Astronomical Society 203rd Meeting, Atlanta, GA. January 4-8, 2004.

12) *Using Amateur Astronomy as Scaffolding into Research Astronomy*. John W. Wilson. Presented to the National Association for Research in Science Teaching 2002 International Meeting, Philadelphia, PA. March 23-26, 2003. (Part of a paper set & panel discussion by Dr. Donald Duggan-Haas.)

11) *Where Is the Science in Science Teacher Education and Science Teaching?* Panel discussion/presentation at the Association for the Education of Teacher in Science 2003 Annual Meeting, St. Louis, MO. Jan. 30-Feb 1, 2003.

10) *Teachers Doing Research Astronomy.* John W. Wilson, Presented to the Southeastern Association of Educators of Teachers of Science Annual Meeting 2002, Kennesaw State University, Kennesaw, GA, Oct. 5, 2002.

9) *The Enculturation of Pre-service Teachers into the World of Research Astronomy*. John W. Wilson, Presented to the National Association for Research in Science Teaching 2002 International Meeting, New Orleans, LA. April 7-10, 2002. (Paper Set with Dr. Claudia Melear.)

8) *Providing an Astronomical Research Experience for In-service and Pre-service Teachers,* John W. Wilson and Edward C. Lucy, Presented to the Association for the Education of Teacher in Science 2002 Annual Meeting, Charlotte, NC. Jan. 10-12, 2002.

7) *Learning Science by Doing Astronomy*, John W. Wilson, presented to Southeastern Association for the Education of Teachers in Science, Tampa, FL. Oct. 12-13, 2001.

6) *A Collaborative Concept Map and Elaboration,* Anita T. Bergmann, John W. Wilson, et al. Presented to the Southeastern Association of Educators of Teachers of Science Annual Meeting 2000, Auburn University, Oct. 7, 2000.

5) *Astronomy Laboratory Activities for Middle and Secondary Schools,* J. W. Wilson, Presented to the American Astronomical Society 195th Meeting, Atlanta, GA. Jan. 11-15, 2000.

4) *A Search for Rapid Optical Variability in Selected Narrow-Line Seyfert I Galaxies.* J. W. Wilson, H. R. Miller, E. C. Ferrara, HJ. P. MacFarland, A. B. Daya (Georgia State University), R. E. Fried (Braeside Observatory), BULLETIN OF THE AMERICAN ASTRONOMICAL SOCIETY, 195th Meeting Abstracts, 115.06, 31, 5, (1999).

3) *Observing Stellar Magnitudes and Colors*, J.W. Wilson, BULLETIN OF THE AMERICAN ASTRONOMICAL SOCIETY, 179th Meeting Abstracts, 66.07, 23, 4,(1991).

2) *The Optical Variability of Arakelian 120, 1977 - 1987*, J.W. Wilson, H.R. Miller, and M.T. Carini, PROCEEDINGS OF ACTIVE GALACTIC NUCLEI CONFERENCE AT GEORGIA STATE UNIVERSITY, 1987, edited by H.R. Miller and P.J. Wiita, 307, 173, (1988).

1) *Photoelectric Photometry of Cataclysmic Variable Star Candidates*, J.W. Wilson, H.R. Miller, J.L. Africano, and R.J. Quigley, BULLETIN OF THE AMERICAN ASTRONOMICAL SOCIETY, 166th Meeting Abstracts, 32.07, 17, 2, 598, (1985).

BOOKS (Astronomy laboratory manuals):

9) Activities in Astronomy, 2013 Edition, John W. Wilson, Contemporary Publishing Company, Raleigh, NC, ISBN 0-89892-402-2, (2013).

8) Activities in Astronomy, 2011 Edition, John W. Wilson, Contemporary Publishing Company, Raleigh, NC, ISBN 0-89892-382-4, (2011).

7) Activities in Astronomy, 2009-2010 Edition, John W. Wilson, Contemporary Publishing Company, Raleigh, NC, ISBN 0-89892-364-6, (2009).

6) Activities in Astronomy, 2007-08 Edition, John W. Wilson, Contemporary Publishing Company, Raleigh, NC, ISBN 0-89892-358-1,(2008).

5) Activities in Astronomy, 2007-08 Edition, John W. Wilson, Contemporary Publishing Company, Raleigh, NC, ISBN 0-89892-336-0,(2007).

4) Astronomy: A Laboratory Textbook, 2006-07 Edition, John W. Wilson, Contemporary Publishing Company, Raleigh, NC, ISBN 0-89892-328-X,(2006).

3) Astronomy: A Laboratory Textbook, 3rd. Edition, John W. Wilson, Contemporary Publishing Company, Raleigh, NC, ISBN 0-89892-202-x,(1999).

2) Astronomy: A Laboratory Textbook, 2nd. Edition, John W. Wilson, Contemporary Publishing Company, Raleigh, NC, ISBN 0-89892-126-0,(1996).

1) Astronomy: A Laboratory Textbook, John W. Wilson, Contemporary Publishing Company, Raleigh, NC, ISBN 0-89892-099-X,(1991).

TEACHING EXPERIENCE:

Astr 140: Descriptive Astronomy (GTA Vanderbilt University)
ASTR 1010: Astronomy of the Solar System
ASTR 1020: Stellar and Galactic Astronomy
ASTR 3010: Topics in Modern Astronomy
ASTR 3500: Quantitative Astronomy
ASTR 6300: Teaching Astronomy (Instructor of Record and co-taught)
ASTR 6310: Teaching Astronomy Lab Practicum (Instructor of Record and co-taught)
ASTR 6999: Directed Readings (with science teachers)
ASTR 7010: Astronomy for Teachers I Lab
ASTR 7020: Astronomy for Teachers II Lab
ASTR 7910: Directed Study in Astronomy for Teachers
ASTR 8900: Astronomy Seminar
ISCI 2002: Integrated Science II (early childhood education)
NSCI 7001/3001: Integrated Science I: Physical Science (middle school education)
NSCI 3002: Integrated Science II: Chemistry and Geology (co-taught)
PHYS 3310: How and Why-The Physics in Everyday Life (Kennesaw State University)
PHYS 7110: Conceptual Physics I (GOML on line class for secondary education students)
PHYS 7120: Conceptual Physics II (GOML on line class for secondary education students)
SCED 4415: The Teaching of Science 7-12 (Kennesaw State University)
SCED 4475: Student Teaching (Kennesaw State University)
SCI 1102: Interdisciplinary Science: Issues in Science (Kennesaw State University)

SCIENCE OLYMPIAD:

GSU Regional Tournament, Division B (Gr. 6-9), Mar. 5, 2016,
Reach for the Stars, Event Coordinator.

GSU Regional Tournament, Division B (Gr. 6-9), Feb. 14, 2015,
Solar System, Event Coordinator.

GSU Regional Tournament, Division B (Gr. 6-9), Mar. 8, 2014,
Solar System, Event Coordinator.

GSU Regional Tournament, Division B (Gr. 6-9), Feb. 16, 2013,
Reach for the Stars, Event Supervisor.

GSU Regional Tournament, Division B (Gr. 6-9), Feb. 18, 2012,
Solar System, Event Coordinator.

GSU Regional Tournament, Division B (Gr. 6-9), Feb. 19, 2011,
Solar System, Event Coordinator.

GSU Regional Tournament, Division B (Gr. 6-9), Feb. 27, 2010,
Solar System, Event Coordinator.

GSU Regional Tournament, Division B (Gr. 6-9), Feb. 21, 2009,
Reach for the Stars, Event Coordinator.

GSU Regional Tournament, Division B (Gr. 6-9), Feb. 23, 2008,
Reach for the Stars, Event Coordinator.

GSU Regional Tournament, Division B (Gr. 6-9), Feb 24, 2007,
The Solar System, Event Coordinator.

GSU Regional Tournament, Division B (Gr. 6-9), Feb 23, 2006,
Reach for the Stars, Event Coordinator.

GSU Regional Tournament, Division B (Gr. 6-9), Feb. 23, 2002,
Reach for the Stars, Event Coordinator.

GSU Regional Tournament, Division B (Gr. 6-9), Feb. 24, 2001,
Reach for the Stars, Event Coordinator.

GSU State Tournament, Division B (Gr. 6-9), Apr. 1, 2000,
Reach for the Stars, Event Coordinator.

GSU State Tournament, Division B (Gr. 6-9), Apr. 3, 1999,
Reach for the Stars, Event Coordinator.

GSU Regional Tournament, Division B (Gr. 6-9), Feb. 28, 1998,
Reach for the Stars, Event Coordinator.

GSU Regional Tournament, Division B (Gr. 6-9), Feb. 22, 1997,
Propeller Propulsion, Supervisor.

GSU State Tournament, Division B (Gr. 6-9), Apr. 2, 1996,
Out of This World, Supervisor.

GSU Regional Tournament, Division B (Gr. 6-9), Mar. 2, 1996,
Out of This World, Supervisor.

GSU Regional Tournament, Division B (Gr. 6-9), Feb. 25, 1995,
Out of This World, Supervisor.

GRANTS, SCHOLARSHIPS & AWARDS

Co-Investigator, along with Ben McGimsey, on STEM grant from GSU: Improving Learning Experiences in Physical Science of Elementary Education Majors through Collaboration between Faculty in the Colleges of Education and Arts and Sciences, Rachel Fiore from College of Education, PI, $7150

Co-Investigator on TQ Grant from UGA: Supporting Science Talk in Physical Science Classrooms, Brett Criswell, PI. I presented 1 workshop for 9-12 grade science teachers.

Participant on MPS grant UGA, Lisa Martin-Hansen, PI. I presented 7 workshops for Middle School (6-8) science teacher in Fulton County, GA.

Co-Investigator on PRISM (NSF) mini-grant. Collaborations between Physicists, Science Teachers, and Students to Study Cosmic Ray Particles – continuation, Funded 2008, $1500.

Principle Investigator on PRISM (NSF) mini-grant. DEVELOPMENT OF NATURE OF SCIENCE AND SCIENTIFIC INQUIRY ACTIVITIES FOR SCIENCE EDUCATION STUDENTS ENROLLED IN A SCIENCE CONTENT COURSE. Funded 2007, $12530

Co-Investigator on PRISM (NSF) mini-grant. Collaborations between Physicists, Science Teachers, and Students to Study Cosmic Ray Particles – continuation, Funded 2007, $1500.

Principle Investigator on PRISM (NSF) mini-grant. DEVELOPMENT OF OBSERVATIONAL ACTIVITES FOR INTRODUCTORY LEVEL ASTRONOMY LABORATORY STUDENTS, Funded 2006, $12300.

Co-Investigator on PRISM (NSF) Mini-grant. Collaborations between Physicists, Science Teachers, and Students to Study Cosmic Ray Particles. Funded 2006, $15000.

Doctoral Student Award (Science Education), Department of Middle-Secondary Education and Instructional Technology, College of Education, Georgia State University, 29 April 2004.

Georgia State University Staff Advisory Council Employee Scholarship, Fall Semester, 2002.

Georgia State University Staff Advisory Council Employee Scholarship, Fall Semester, 2001.

Georgia State University Staff Advisory Council Employee Scholarship, Fall Semester, 2000.

Georgia State University Staff Advisory Council Employee Scholarship, Fall Semester, 1999.

COMMITTEES

University, College, and Department Committees

Assessment Committee, Department of Physics and Astronomy, College of Arts and Sciences, Georgia State University, 2006-present.

Curriculum Committee, Department of Physics and Astronomy, College of Arts and Sciences, Georgia State University, 2013-present.

Physics Education Faculty Search Committee, Department of Physics and Astronomy, College of Arts and Sciences, Georgia State University, 2012.

Lecturer Search Committee (2 positions), Department of Physics and Astronomy, College of Arts and Sciences, Georgia State University, 2012.

Lecturer Search Committee, Department of Physics and Astronomy, College of Arts and Sciences, Georgia State University, 2011.

Faculty Search Committee, Department of Middle-Secondary and Instructional Technology, College of Education, Georgia State University, 2010.

Assessment Committee, Department of Physics and Astronomy, College of Arts and Sciences, Georgia State University, 2004-2005.

Faculty Search Committee, Department of Middle-Secondary and Instructional Technology, College of Education, Georgia state University, 2004/05

Assessment Committee, Chair, Department of Physics and Astronomy, College of Arts and Sciences, Georgia State University, 2013- present.

Curriculum Committee, Department of Physics and Astronomy, College of Arts and Sciences, Georgia State University, 2013- present.

Ph.D. Dissertation Committees

Barbara Ford, Learning to Teach (December 2006). Department of Middle-Secondary and Instructional Technology, College of Education, Georgia State University.

Christopher Oakley, (December, 2013). "MIXED METHODS ANALYSIS OF UNDERGRADUATE QUANTUM MECHANICS: AN EXPLORATORY CASE STUDY", Department of Physics and Astronomy, College of Arts and Sciences, Georgia State University.

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