MARY GEER DETHERO

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EDUCATION

Georgia State University *Expected December 2025*
PhD in Astronomy

Georgia State University *May 2022*
Master of Science in Physics

Lehigh University *August 2015 - May 2019*
Bachelor of Science, Astrophysics
Minor in Applied Mathematics

RESEARCH EXPERIENCE

NASA Intern, Goddard Space Flight Center *June 2023 - August 2023*
Advisor: Keith Gendreau
NICER X-ray data analysis for the active binary star system DS Tucanae with a confirmed exoplanet. The analysis includes identifying flares and modeling spectra.

Graduate Research Assistant, Georgia State University *July 2019 - present*
Advisor: Jane Pratt
Investigate stellar convection of main sequence, pre-main-sequence, and red giant stars using hydrodynamic simulations with the `MUSIC` code.

Eckardt Senior Thesis Project, Lehigh University *August 2018 - May 2019*
Advisor: M. Virginia McSwain
Used Gaia data to investigate galactic structure and model the stellar density of the Milky Way galaxy.

Independent Research Project, Lehigh University *January 2018 - May 2018*
Advisor: M. Virginia McSwain
Compared Gaia data for massive O stars in order to investigate the kinematics and rotation curve of the Milky Way Galaxy and behavior of runaway stars.

Summer Intern, National University of Ireland in Galway *June 2017 - July 2017*
Advisor: Matthew Redman
Assisted with the development of computer program PyCross to analyze spectral data from 3-D digital models of nebulae created in the Shape program.

PUBLICATIONS

M. G. Dethero, et al., "NICER X-ray Observations of V1716 Sco," Astronomer's Telegram, No. 16167, 1 Aug 2023.

PRESENTATIONS

M. G. Dethero, "Nova V1716 Sco," CRESST II Final Event, Greenbelt, MD, 10 Aug 2023.

M. G. Dethero, "Investigating stellar flares in the young, binary system DS Tuc," Directorate Summer Student Presentation, NASA GSFC, Greenbelt, MD, 4 Aug 2023.

M. G. Dethero,, "Investigating stellar flares in the young, binary system DS Tuc," X-ray Lab Monthly Meeting, NASA GSFC, Greenbelt, MD, 4 Aug 2023.

M. G. Dethero, Emma Charles, Isiah Holt, "NICER Analysis Threads: Challenges and Solutions," NICER Team Tag-Up, NASA GSFC, Greenbelt, MD, 3 Aug 2023.

M. G. Dethero, "Overshooting, filling factors, and plume dynamics: the shape of stellar convection in stars," `MUSIC` Team Talks, University of Exeter, Virtual, 20 Jan 2023.

Dethero, M. G., Pratt, J., Baraffe, I."Overshooting, plume dynamics, and filling factors: the shape of compressible convection in stars," American Astronomical Society, 241st meeting, Seattle, WA, 9 Jan. 2023.

M. G. Dethero, J. Pratt, "Overshooting, filling factors, and plume dynamics: the shape of compressible convection in the deep interior of stars," Graduate Conference for Research, Scholarship, and Creative Activity, Georgia State University, Atlanta, GA, 11 Nov 2022.

M. G. Dethero, "Stellar Convection," Summer Lunch Talk for Undergraduates, Georgia State University, Virtual, 15 July 2021.

M. G. Dethero,, "Filling Factor in Stellar Convection," `MUSIC` Team Talks, University of Exeter, Virtual, 27 May 2021.

Dethero, M. G., Pratt, J., Baraffe, I."A comparison of the filling factor in hydrodynamic simulations of pre-main-sequence stars," Cool Stars 20.5, Virtual, 25 Feb. 2021. Poster.

Dethero, M. G., Pratt, J., "A first look at convective overshooting in hydrodynamic simulations of the F-type eclipsing binary BW Aquarii," Royal Astronomical Societys Early Career Poster Exhibition, Virtual, 14-28 Sept. 2020. Poster.

J. Pratt, I. Baraffe, **M. G. Dethero,** K. Gartner, Convective overshooting in hydrodynamic simulations of the F-type eclipsing binary BW Aquarii, American Astronomical Society, 235th meeting, Honolulu, HI, 6 Jan. 2020.

Dethero, M. G., McSwain, M. V., "Investigating Milky Way Structure with Gaia," Eckardt Scholar Senior Thesis Presentation, Bethlehem, PA, 5 May 2019.

Dethero, M. G., McSwain, M. V., "Investigating Milky Way Structure with Gaia," 39th Annual Central Pennsylvania Consortium Astronomers Meeting, Gettysburg, PA, 27 Apr. 2019. Poster.

Dethero, M. G., McSwain, M. V., "Kinematics of the Milky Way Galaxy," Lehigh University Undergraduate Research Symposium, Bethlehem, PA, 3 May 2018. Poster.

TEACHING EXPERIENCE

Lab Instructor, Georgia State University *August 2019 - present*
PHY 1112 - Introductory Physics II (1 section)
ASTR 1020 - Stellar and Galactic Astronomy (6 sections)
ASTR 1010 - Solar System Astronomy (6 sections: 3 in person, 3 online)
Teaching Assistant, Georgia State University *August 2020 - May 2021*
PHY 3550 - Mathematical Methods and Computational Physics I (1 section, online)
PHY 3560 - Mathematical Methods and Computational Physics II (1 section, online)
Lecturer, Georgia State University *February 2020*
ASTR 1010 - Solar System Astronomy (1 75 minute lecture)

SKILLS

Coding Experience:
Python, Fortran, C++, R, Linux, Bash, Emacs, LaTeX.
Astrophysical Codes:
MESA, `MUSIC`, Rayleigh, ESTER, HEASoft, XSPEC
Workshops:

NASA GSFC Python Bootcamp June-July,2023
XSEDE HPC Workshop: MPI September 1-2, 2020
UKMHD 2021 May 17-23, 2021
Kavli Summer Program in Astrophysics Conference: Fluid of the Sun and Stars June 6-11, 2021
Maria Mitchell Women in Science Symposium September 22-23, 2022

AWARDS AND HONORS

John Mather Scholar, NASA GSFC and National Space Grant Foundation *July 2023 - present*

Second Century Initiative Fellow, Georgia State University *August 2019 - 2023*

Eckardt Scholar, Lehigh University *August 2015 - May 2019*

Alice P. Gast Women in STEM Scholarship, Lehigh University *August 2015 - May 2019*

Lehigh Scholar Award, Lehigh University *August 2015 - May 2019*

SERVICE & OUTREACH

Astronomy Peer Advising Leaders, Georgia State University *August 2021 - present*
Co-President *August 2022 - present*
Mentor *August 2021 - present*

Invited Talk: Gateway to Physics Course, "My journey in astrophysics," Georgia State University, Atlanta, GA, 24 Oct. 2022.

Invited Panelist at REU Program "Surviving Graduate School," Georgia State University, Atlanta, GA, 28 June 2022.