Astr 1020 * Spring 2015
TR 9:30-10:45 am
Stellar and Galactic Astronomy
• Your instructor: Douglas Gies
• Astronomy at Georgia State University
• Syllabus
• Survey
• Introduction to night sky

Hard Labor Creek Observatory
HLC State Park, Rutledge, GA

Apache Point Observatory
Sunspot, New Mexico

GSU CHARA Array
Mount Wilson, California

0.9 m Telescope
Cerro Tololo Interamerican Obs., Chile

ASTR 1020: Stellar and Galactic Astronomy
Spring 2015  •  TR 9:30 am - 10:45 am  •  Longhoh Hall 406  •  4CR

Instructor: Dr. Douglas H. Gies
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E-mail: gies@gsu.edu
WWW Site: http://www.astro.gsu.edu/~gies/ASTR1020/

Office Hours: W 11:00 am - noon or by appointment (ask after class, call, or e-mail me).
Prerequisites: Completion of ASTR 1010 or equivalent.
Course Objectives: This is a survey course designed for non-specialists that completes the topics in astronomy begun in ASTR 1010. Students will learn through lectures and reading about the processes that have formed the current universe and develop a perspective about our place and time in the universe.

Textbooks: The Cosmic Perspective (7th ed.) by Bennett, Donahue, Schneider, & Voit (2014; ISBN 6-321-83985-2; Pearson Education, Inc.).
Grades:
• Laboratory .................................. 20%
• Final 10 of 12 assignments .................. 20%
• Notebook .................................... 10%
• Midterm exam ................................ 10%
• Final exam ................................... 10%
• Attendance bonus (5 days) .................. [± 10%]

Grade scheme:
A = 90-100%, A- = 88-89.5%, B+ = 86-87.95%, B = 85-86.5%, B- = 84-85.25%,
C+ = 77-79.5%, C = 75-77.5%, C- = 74-76.5%, F = 0-74.5%.

Laboratory:
• Labs for this class are:
  @1002 Tuesday 11:00 am – 12:00 pm
  @1001 Tuesday 1:00 pm – 2:00 pm
  @1002 Wednesday 8:00 am – 9:00 am
  @1202 Wednesday 10:00 am – 11:00 am
  @1203 Thursday 1:00 pm – 2:00 pm
• See the lab syllabus at http://www.astr.uga.edu/lab/.
• Labs begin the week of January 20 and are held in 516 Kel Bell.
• You are required to attend the same laboratories sessions each week.
• The lab will include one evening session for observing with telescopes.
• The lab textbook is Astronomy: A Laboratory Textbook, 4th edition, by John W. Wilson.
• Bring a drawing compass, protractor, 30 cm ruler, and simple calculator.
• A passing lab grade is required in order to pass the course.

Important Dates to Remember:
January 27 - Laboratory meetings begin.
February 26 - Midterm Exam.
March 2 - Last day to withdraw and receive a grade of W.
April 30 - Final Exam.

Key Web Sites:
• GHS: Reid Lab Undergraduate Observatory: http://www.astr.uga.edu/RLO/.
• Fornbank Science Center and Observatory: http://www.fornbank.uga.edu/.
• Sky and Telescope Magazine: http://www.skynow.com/
• The Evening Sky Map: http://skymap.com/download.html.

Note:
The table attached gives a projected schedule of topics to be covered in each class (including the relevant chapters in the textbook). Please read the text before classes.
The course syllabus provides a general plan for the course; deviations may be necessary.
Your constructive assessment of this course places an indispensable role in shaping education at Georgia State. Upon completing the course, please take time to fill out the online course evaluation.
Students who wish to request accommodation for a disability may do so by registering with the Office of Disability Services. Students may be accommodated upon request by the Office of Disability Services of a signed Accommodation Plan and are responsible for providing a copy of that plan to instructors of all classes in which accommodations are sought.

Assignments: I will post homework assignments almost every week on the class web site:
http://www.astr.uga.edu/~giles/ASTR1020/

• Please exchange names and contact information with students sitting near you.
• Please fill out the survey now and return to me.
Chapter 1
Our Place in the Universe

• What is our place in the universe?
• What units do we use for distance?
• How is distance related to history?
• What’s up in the sky?

Distances in Astronomy
• Astronomical Unit = the average distance between the Earth and Sun (1.5 x 10^8 km)
• Parsec = the typical distance between stars as defined by the angular wobble caused by Earth’s orbit (3.1 x 10^13 km)
• Light-year = the distance light can travel in one year (9.5 x 10^12 km)

How big is Earth compared to our solar system?
Let’s reduce the size of the solar system by a factor of 10 billion; the Sun is now the size of a large grapefruit (14 cm diameter).

How big is Earth on this scale?
A. an atom
B. a ball point
C. a marble
D. a golf ball

The scale of the solar system
• On a 1-to-10 billion scale:
  – Sun is the size of a large grapefruit (14 cm)
  – Earth is the size of a ball point, 15 meters away.

Let’s reduce the size of the solar system by a factor of 10 billion; the Sun is now the size of a large grapefruit (14 cm diameter).

How big is Earth on this scale?
A. an atom
B. a ball point (100 times smaller than Sun)
C. a marble
D. a golf ball
How big is the Milky Way Galaxy?

The Milky Way has about 100 billion stars. On the same ten billion-to-one scale….

How can we know what the universe was like in the past?

• Light travels at a finite speed (300,000 km/s).

<table>
<thead>
<tr>
<th>Destination</th>
<th>Light travel time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moon</td>
<td>1 second</td>
</tr>
<tr>
<td>Sun</td>
<td>8 minutes</td>
</tr>
<tr>
<td>Vega (nearby star)</td>
<td>25 years</td>
</tr>
<tr>
<td>Andromeda Galaxy</td>
<td>2.5 million years</td>
</tr>
</tbody>
</table>

• Thus, we see objects as they were in the past: 
  *The further away we look in distance, the further back we look in time.*

Night Sky Tonight

• Orient map with direction you are facing at the bottom of page.