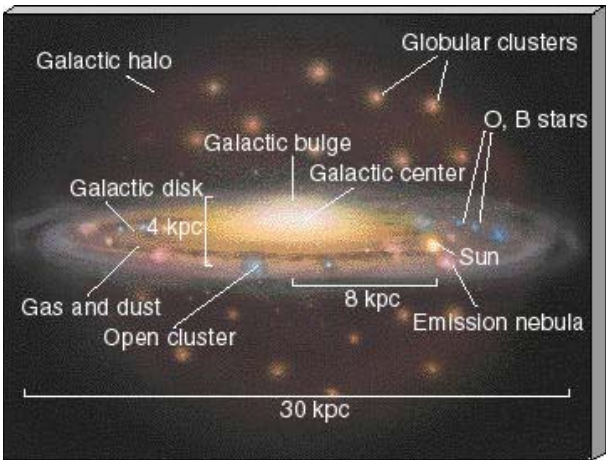
ASTRONOMY 1020-001
INTRODUCTORY ASTRONOMY 2

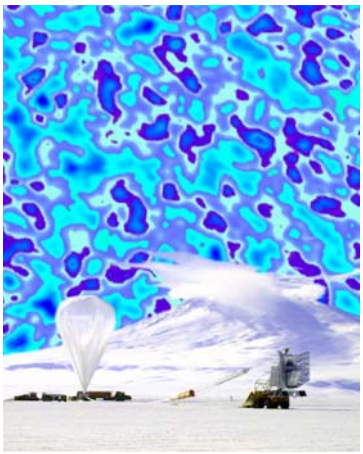
T-Th 9:30-10:45; Room G1B20
Professor Glenn
Office: Room F913, (303) 492-6073, jglenn@casa.colorado.edu
Office Hours: T, Th 11:00-12:00 & by appointment

Why would you take ASTR 1020?

To learn why stars shine, to learn why you wouldn't want to live close to a black hole, to learn what galaxies are made of, and to learn why we think there was a Big Bang. Here are a couple of diagrams you will be able to explain by the end of the semester.



An artists rendition showing our current understanding of the structure and contents of the Milky Way ("Astronomy Today", 3rd ed., by Chaisson & McMillan).



The sky seen at microwave wavelengths with the Boomerang experiment. Mt. Erebus is in the background (courtesy the Boomerang team, the NSF, and NASA).

Course Prerequisite: ASTR 1010 or 1110

You should already know how atoms, gravity, and light work (Chapters 4-7 of text), and have a basic understanding of our Solar System. ASTR 1020 satisfies a natural science requirement for the arts and sciences core curriculum.

Course Goals

Astronomy:

- To develop a basic understanding and appreciation of the physical universe.
- To understand how astronomers learn about the Universe.
- To demonstrate that our understanding of the Universe is constantly changing subject to new observations and interpretations—science is exciting!
- To encourage you to follow current events in astronomy.

General: Exercise critical thinking and quantitative reasoning skills (*there will be math in this course*). These skills are very useful outside of astronomy too.

Course Content

- *Brief* review of physical concepts: atoms, gravity, light, & telescopes
- The Sun; star formation and evolution; star death
- The Milky Way & other galaxies
- Cosmology: the evolution of the Universe

Class Format

The class will consist of lectures, demonstrations, and presentations at the Fiske Planetarium. There will be interactive concept tests during class for credit. You must purchase a "Clicker" from the CU Bookstore for this class.

Text

"The Cosmic Perspective" by Bennett, Donahue, Schneider, & Voit, 3rd Ed. This text gives very good physical descriptions of processes in our Universe. You must read all of Chapters 15-23 and any other materials I assign.

Coursework and Grading (yes, grades will be curved)

1. Three exams and the final (all multiple-choice), which is cumulative (15%, 15%, 15%, and 25%, respectively).
2. Daily quizzes with clickers (10%). Your three lowest scores will be dropped.
3. One set of 2-3 observations from one night at the SBO, (10%, with up to 5% extra credit possible).
4. In-class concept tests with clickers (10%). Your three lowest scores will be dropped.

Late Assignments & Makeup Exams

Makeup exams will only be given with a doctor's note or the equivalent. If you cannot make the prescheduled time for the final exam, make arrangements with me for an alternative time by the end of the sixth week of class (CU policy).

Attendance & Additional Policies

You are expected to attend lectures. The quiz and exam materials will be drawn from the lectures and the textbook. *Copying and cheating will result in a minimum penalty of zero credit.*

Students with Disabilities

If you have specific physical, psychiatric or learning disabilities and require accomodations, please let me know early in the semester so that your learning needs may be met. You will need to provide documentation of your disability to the Disability Services Department (303-492-8671) at the beginning of the semester.

PRELIMINARY* SCHEDULE

Section 1: Review of Atoms, Gravity, & Light; Telescopes; the Sun	
Review of Gravity (Ch. 5)	08/28
Review of Atoms & Light (Chs. 4 & 6)	09/02
Constellations (Fiske Planetarium)	09/04
Telescopes (Ch. 7)	09/09
Last Day to Drop	09/10
The Sun: A Nuclear Reactor (Ch. 15)	09/11,16,18
Exam 1:	09/23
Section 2: Stars, Star Formation & Evolution, & End States of Stars	
Stellar Classification, Binary Stars, & the H-R Diagram (Ch. 16)	09/25,30,10/07
Fall Break!	10/02
Stellar Evolution (Ch. 17)	10/09
Stellar Explosions, White Dwarfs, & Neutron Stars (Ch. 18)	10/14
Black Holes (S3, Ch. 18)	10/16
Exam 2:	10/21
Section 3: The Milky Way & Galaxies	
The Interstellar Medium & Star Formation (Ch. 17, 19)	10/23
The Milky Way's Structure (Fiske Planetarium) (Ch. 19)	10/28
The Milky Way: Composition, Spiral Arms, Dark Matter (Ch. 22)	10/30,11/04
Nearby Galaxies (Fiske Planetarium) (Ch. 20)	11/06
Nearby Galaxies	11/11
Galaxy Evolution and Active Galactic Nuclei (Ch. 21, 22)	11/13
Exam 3:	11/18
Section 4: Cosmology: The Evolution of the Universe	
The Expansion of the Universe (Ch. 20)	11/20
The Cosmic Microwave Background (Ch. 23)	11/25
Thanksgiving	11/27
Inflation and the Early Universe (Ch. 23)	12/02
Life in the Universe (Ch. 24)	12/04
Observations due	*12/09*
Review	12/09,11
Final Exam (7:30-10:00 AM)	**12/15**

**This schedule is preliminary but the exam dates will not change.*

Observations

Observe any three different celestial objects from the Sommers-Bausch Observatory on campus (http://www.colorado.edu/sbo/). Use the appended sheet for recording and describing your observations. **You will have to copy the appended sheet for observations 2 and 3 before you go to the SBO: no copy machine is available at the SBO.** A signature from the telescope operator is required for each observation. The dates for observations will be given in class. Don't wait until late in the semester! Each observation is worth 5% of your total grade, *so up to 5% extra credit available if you do all three.*

SBO Observations

Your Name:_____ Date:_____

Signature of Telescope Operator:_____

Object Observed:_____

Rough Sketch of Object:

In the space below, explain what you saw (you can use your textbook to help you by either looking up the specific object you observe or that type of object). Do this by trying to answer these questions. What is the object? Does the emission (light) you observe come from one source or many (e.g., a star, many stars, interstellar gas)? What is the source of energy for the emission you observe? If you can see any color, try to give a reason for it (i.e., temperature, interstellar extinction, elemental composition).