

Astronomy 115: Introduction to Astronomy

Science Building Room 201, San Francisco State University

Fall 2010, MWF 11AM

Contact Information

Professor: Andisheh Mahdavi

Office: Thornton Hall 527

Email: amahdavi@sfsu.edu (put "ASTR115" in the subject) **Telephone:** (415) 338-1697

Website: <http://physics.sfsu.edu/~amahdavi/astr115>

Office Hours: Wednesdays 1:15-3:45PM; sign up at the above website to get priority

Audience

Non-science majors familiar with high-school algebra.

Course Description

At the beginning, the entire universe was a colossal fireball with a temperature of over one billion degrees Kelvin. Out of this scorching birth came a host of galaxies, stars, planets, and human beings. We will explore the story of our cosmic origins; learn how unseen forces have guided the growth of the universe; witness the evolution of galaxies; follow the birth, life, and spectacular death of the stars. We will learn about the dark side of the universe, where the Albert Einstein's terrifying predictions roam freely. We will see how planets and carbon-based life rose from the ashes of extinct stars, and speculate on interstellar travel and the existence of life outside the earth.

Expected Student Learning Outcomes

At the end of the course, the successful student will be able to tell the difference between dark matter, dark energy, and black holes; to set out the evidence for the hot big bang as the leading theory for the beginning of the universe; explain Einstein's theory of relativity in simple terms; to trace the stellar life cycle; to calculate the temperature, brightness, distance, mass, of astrophysical objects; to explain the basic properties of light, and how to use telescopes to look back in time and learn about far-off objects.

Textbooks, Materials, and Other Requirements and Fees

- **Student Agreement:** Must be signed and returned by 5:00PM on August 27.
- **Attendance:** Required. Exams may contain questions covered in lecture but not elsewhere.
- **MasteringAstronomy:** All homework must be completed online at the MasteringAstronomy site, <http://masteringastronomy.com>. Access codes for MasteringAstronomy come free with new textbooks, or can be bought for \$35 at the website. See "textbook" below for detail. Students who do not attempt all homework will be dropped from the course.

Once you have access to MasteringAstronomy, use the code MAHDAVIFALL2010 to register.

- **Textbook:** The textbook for the course is "The *Essential* Cosmic Perspective with MasteringAstronomy," 5th edition, by Bennett et al. You can buy the book new. It costs \$130 at the SFSU bookstore. It's cheaper online. New copies of the book will come with a code that gives you free access to the homework website. If you buy the book used, it probably will not come with free access

to the homework website. You will have to pay \$35 extra, on top of what you paid for the used book, at <http://masteringastronomy.com>

A third option is to buy the ebook. This means you will only be able to view the book on your computer. You can get the ebook + homework access for \$85 at <http://masteringastronomy.com>.

Once you make your purchase, you'll have access to homework website. Before you can get to the assignments, you will need the "Course ID" for our course. Our Course ID is MAHDAVIFALL2010

The "Course ID" is different from the "access code." The access code is like a purchase receipt; it's different for each student. The "Course ID" is the unique identifier for our course and is the same for everyone.

- **Email and Internet Access:** At least two hours weekly required for completing the homework online. *Students who plan to use public SF State computers for online homework should be aware of potentially long waiting times during peak hours.*

Grading Policy and Key Dates

Thirteen Homeworks: 37%; Two Midterm exams: 34%; One final exam: 29%

Scale: A: 90-100%; A-: 83-90%; B+: 80-83%; B: 73-80%; B-: 69-73%; C+: 65-69%; C: 60-65%; C-: 50-60%; D+: 47-50%; D: 43-47%; D-: 40-43%

Homework assignments may be started on Wednesday and are due online the following Wednesday by 9:00AM. **Late assignments will receive only partial credit.**

First midterm: September 29; Second midterm: November 3; Final exam: December 15th

Students may improve their grade by up to 8% by doing extra credit projects. Details will be revealed later in the course.

Waiting Lists

I am maintaining a waiting list. The list begins with the official university list. Other students who would like to enroll in the course may add their names to the waiting list during class. Students on the waiting list must sign in every day. Priority will be given to students who attend lectures and complete homeworks.

Appointments for Office Hours

Drop-ins are welcome, but students who make appointments on the course website will be given preference for office hours. Students are encouraged to make appointments to avoid unnecessary waiting. Students wishing to meet at a time other than the regular office hours need to arrange this via email.

Useful contacts

General Computer problems: SFSU Helpdesk, 338-1420 or helpdesk@sfsu.edu

MasteringAstronomy help: <http://www.masteringsupport.com/MasteringAstronomy/student/topfaqs.htm>

Astronomy Tutoring: <http://www.sfsu.edu/~lac/astronomy.html>

Students with Disabilities

Students with disabilities who need reasonable accommodations are encouraged to contact the instructor. The Disability Programs and Resource Center (DPRC) is available to facilitate the reasonable accommodations process. The DPRC is located in the Student Service Building and can be reached by telephone (voice/TTY 415-338-2472) or by email (dprc@sfsu.edu)

Astronomy 115 Course Calendar - 11AM Section

This is a calendar of the general order of topics we will cover, as well as the important dates for the course.

Week	Topics	Chapters	Notes
8/23	Our place in the Universe	1	Student Agreement Due 8/27
8/30	Night sky, moon, seasons, eclipses, history of astronomy	2-3	Homework 0 Due 8/30; 1st Homework due 9/1
9/6	The nature of science; Gravity, energy, and orbits	3-4	Last day to drop course is 9/7; 2nd Homework due 9/8
9/13	Light & telescopes; emission and absorption; Doppler shift	5	3rd Homework Due 9/15
9/20	Birth of our solar system; others suns and extrasolar planets	6	4th Homework Due 9/22
9/27	Structure of the solar system and the planets	7-9	1st Midterm September 29
10/4	Deep into our Sun; fusion, fission, and nuclear weapons	10	5th Homework Due 10/6
10/11	Understanding stars: formation, main sequence and the color-brightness diagram	11	6th Homework due 10/13
10/18	Life of the stars, death of the stars, and supernovae	12	Last day to request CR/NC is 10/19; 7th Homework due 10/20;
10/25	Relativity: Einstein, black holes, wormholes, and interstellar travel	Lecture only	8th Homework due 10/27
11/1	White dwarfs, neutron stars, and black holes	13	2nd Midterm November 3
11/8	The Milky Way and other galaxies	14-15	9th Homework due 11/10
11/15	Galaxy types and evolution; supermassive black holes; clustering	15-16	10th Homework due 11/17
11/22	Fall recess—no classes		
11/29	Dark matter, dark energy, and cosmology	16-17	11th Homework due 12/1
12/6	The birth of the Universe and the rise of carbon-based life	17-18	12th Homework Due 12/8
12/13	Review for final exam		Last day of instruction 12/13; Final exam 12/15 10:45AM-1:15PM

Astronomy 115 Student Agreement

This copy is for you to keep; you must sign and return the other copy of the agreement to Professor Mahdavi by 5:00PM on August 27

I understand that to continue enrolling in Professor Mahdavi's Astronomy 115 section I need to sign the following agreement.

1. **Show up.** I promise to attend every lecture (except in case of a dire emergency) and realize that my chances of obtaining a good grade are significantly lower if I miss lectures.
2. **Respect other students.** I understand that questions are welcome at any time throughout the course, and time will be provided for discussion of the subject materials among students. However, off-topic discussions between students are disruptive, and students who repeatedly engage in off-topic discussions will be asked to leave the lecture hall.
3. **Keep it distraction-free.** I understand that phones, media players, laptop computers, and other electronic devices must not be used during the lecture, unless required to support a disability. Students who use such devices without permission will be asked to put them away. Simple pocket calculators are exempt from this requirement, and may be used at all times.
4. **Homework is online only.** I understand that an internet connection is required to do the homework assignments. It is my responsibility to make sure that I have sufficient internet access to complete the homework assignments. If I plan to use SF State's public computer rooms, I understand that waiting times to use the public computers can be very long during peak hours, and that this cannot be used as an excuse for late homework.
5. **Have a good Internet browser.** If I plan to use my personal computer to do the homework assignments, I understand that a relatively up-to-date, flash-enabled browser (Internet Explorer 7 or later, Mozilla Firefox 3 or later, or Apple Safari 3 or later) is required.
6. **Personal computers need care.** I understand that viruses, malware, dropped internet connections, and certain browser add-ons (such as AdBlock or Flashblock) may interfere with my access to the online component of this course. These and similar errors are not the responsibility of Professor Mahdavi or other Astronomy 115 staff, and may be resolved by contacting the SFSU computer help desk, or the MasteringAstronomy support (see the syllabus for contact information). Unless the errors affect everyone in the course, they do not constitute a valid excuse for late homework or other missed assignments.
7. **Email needs to be checked.** I have a functioning email address and will check my email at least weekly for course updates from Professor Mahdavi. When writing to professor Mahdavi, I will put "ASTR115" in the subject of my email. I realize that certain email providers, such as AOL, can block emails with attachments, or have overly aggressive spam filters (such as whitelists). It is my responsibility to configure these unreasonable spam prevention features so that I do not miss critical emails from Professor Mahdavi or other SFSU faculty and staff.

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Sign your name: _____ **Your ID Number:** _____