ASTRONOMY 2 (Course ID: ASTR-002 -02)  
OVERVIEW OF THE UNIVERSE, FALL 2003
Class times/room: 12:00 noon – 1:45 pm, Tue/Thu; Jack Baskin Engineering 152
Class website: http://www.ucolick.org/~raja/ay2.html

Instructor: Raja Guha Thakurta  
Office hours: Tue, 10:30 – 11:30 am  
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Teaching Assistants:  
Alex McDaniels  
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Ryan Montgomery  
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Room: ISB 255; E-mail: rmon@gmes@astro.ucsc.edu; Phone: 9-5722

Topics / Schedule: This is a one-quarter introductory course on astronomy and astrophysics. The subject matter includes: origin & evolution of the Universe, and the Big Bang model; galaxies & their constituents, including stars, planets & the interstellar medium; various kinds of normal & active galaxies; formation & evolution of galaxies; life cycle & death of stars, including supernovae, white dwarfs, neutron stars & black holes; nucleosynthesis (origin of the elements); dark matter. Such studies require knowledge of simple mechanics and basic laws of radiation, quantum mechanics, and nuclear & particle physics which we shall develop as we go along. A detailed calendar listing weekly topics, homework deadlines, exam dates, and holidays is on the class website. The actual material covered may be somewhat different from this depending on our rate of progress.

Emphasis / Background: I will emphasize scientific methods and the process of discovery, not just facts about the Universe, and students are expected to develop a quantitative grasp of key astrophysical concepts. The course material is self-contained. No previous college-level math, physics, or astronomy is required. It will be assumed, however, that the student has mastered elementary arithmetic, algebra, and powers, and has some familiarity with scientific concepts and reasoning. A background in math or physics will definitely make the course easier. If you don’t have such a background, however, you may take heart in the fact that some of the best students in the past in Astronomy 2 have been non-science majors who took a strong interest in the course material. It is advisable to purchase a small inexpensive calculator, if you don’t already own one. Be sure to get one that does powers, roots, and logarithms. Questions and classroom discussion are encouraged, both for your benefit and to help me properly pace the course. Please browse astronomy web sites (we’ll provide some links on the class website) and share your findings, comments, questions, etc in class.

Exams / Homework: There will be a midterm exam and a final exam, both in Jack Baskin Engg 152 (our usual classroom). The midterm will be on Thu 10/23 12:00 noon – 1:45 pm (usual class slot) and the final on Tue 12/08 12:00 noon – 3:00 pm (extending beyond the usual class slot). Both exams will be open book and open notes and will consist of short multiple choice and true/false questions and short math problems. There will be two homework sets, similar in format to the exams. HW#1 is to be turned in
by Tue 10/14 and HW#2 by Tue 11/18. The HW sets will be posted on the class web page about 10 days before their respective due dates.

**Evaluation:** Performance in this course will be judged on the basis of: (i) final exam (50% of overall grade); (ii) midterm exam (35%); and (iii) two homework problem sets (total 10%); and (iv) in-class participation (5%). Everyone who makes a genuine effort on all aspects of the course stands a good chance of passing.

**Texts / Reading:** The primary textbook for this course is:

1. *The Cosmic Perspective* (Addison Wesley, 3rd Edition) by Bennett, Donahue, Schneider & Voit

Two additional textbooks that you might consider are:

1. *Introductory Astronomy & Astrophysics* (Saunders, 3rd Edition) by Zeilik, Gregory & Smith

Each of these books (including the primary text) contains only a small fraction of the material that will be covered in class; you may still find it useful to own one of the books. The class website will list week-by-week reading chapters from these books. All three books will be on reserve at the Science Library.

**Notes / Lecture Outline & Illustrations:** Since the course material is not contained in any single book or texts, PLEASE COME TO CLASS and TAKE GOOD NOTES! These will likely be your most accurate source of information when you’re working on a homework set or studying for the exams. An electronic copy of the lecture outline (text + illustrations) is available on UCSC’s Electronic Reserves (ERes) web site:

http://eres.ucsc.edu/courseindex.asp

(search by course, department or instructor name; password: BigBang). However, you’ll find the notes hard to follow if you don’t come to class.

**Discussion Sections / Office Hours:** Alex McDaniel and Ryan Montgomery, the teaching assistants for this course, will run four (4) weekly discussion sections:

- Mon, 2:00 – 3:10 pm (Ryan/ISB 165)
- Wed, 1:00 – 2:10 pm (Alex/ISB 165)
- Tue, 10:00 – 11:10 am (Alex/ISB 126)
- Thu, 3:00 – 4:10 pm (Ryan/ISB 165)

Attendance at sections is optional. We are also available during office hours and at other times by appointment (best to set up by e-mail).

**Field Trip:** Weather permitting, there will be a class trip to Lick Observatory’s Mt Hamilton Station during the quarter. Mt Hamilton is a 2-hour drive from UCSC each way, much of it along a very windy road in the hills east of San Jose. Some transportation will be provided; you are also welcome to drive. We will leave UCSC around 3 pm and return by midnight. The visit will include a tour of the observatory’s largest telescope, the Shane 3-meter (120-inch) telescope, and viewing through the 0.9-meter (36-inch) telescope. In past years, this has invariably been the highlight of the course.