AST 107: The Universe

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Lectures:
Definitions and Scale
Constellations and Sky Motions
Solar Motion
Precession, Time and the Calendar
Moon's Orbit, Phases, Eclipses and Tides
Motions of the Planets
Ptolemy vs. Copernicus
Galileo and Tycho Brahe
Johannes Kepler
Sir Isaac Newton
Universal Gravitation
Discovery of Uranus and Neptune
Scale of the Solar System and Newton's Universe
Albert Einstein and Special Relativity
General Relativity - a New Theory of Gravity
The Electromagnetic Force, Radiation and Spectra
Kapteyn's Universe of Stars
The Shapley Universe: the Milky Way Galaxy
The Leavitt/Hubble Universe of Galaxies
Morphology of Galaxies
Hubble's Expanding Universe
Interpreting Hubble's Law
Big Bang Cosmology
The Steady State Alternative
The Cosmic Background Radiation
Mapping the Universe of Galaxies
Quasars, Active Galaxies and Black Holes
Galaxy Formation
All About Matter: The Standard Model of Physics
Supernovae
The Hot Universe: Element Formation
Dark Matter
Dark Energy and the Future of the Universe
Quantum Mechanics and the Inflationary Universe
String Theory: Putting it All Together?
Course Information

Texts:

T. Kuhn, *The Copernican Revolution*

R. Kirshner *The Extravagant Universe*

General Remarks and Math Level:

This is a "General Education" course which is intended for students not majoring or planning to major in a science. It is NOT an appropriate course for someone who intends to become an Astronomy major. It is assumed that everyone in the course has a standard high school preparation in mathematics which should include the ability to solve simple algebraic equations, understand graphs and functions, and do simple trigonometry. Mathematics at this level will be used in the course. Anyone experiencing difficulty with this should get help from the instructor, from their lab TA or from the Math Workshop.

Buying a Star Wheel (and flashlight?):

All AST 107 students need to have their very own Star Wheel. You may purchase one for the special low price of $1.00 after class or from the departmental secretary at the Astronomy Department. The office is open between 10:00 A.M. and 4:00 P.M. Buy a star wheel as soon as possible and bring it with you to class and to lab. You may also wish to purchase a flashlight for use at night. It's not absolutely essential, but could be helpful. (We don't sell flashlights! - try a local hardware store or WalMart's) If you have red nail polish, you may wish to coat the glass cover of your flashlight with it, so that it produces a dull reddish glow. This is PERFECT for astronomy, since it allows you to see your starwheel without the blinding effects of bright white light. Another possibility is to use red cellophane over the flashlight. We'll give that to you at the first lab meeting.

Labs: Grading and Attendance Policy

*Attendance at the Labs is mandatory.* Everyone must be enrolled in a lab section and complete all the labs. **If you miss even one lab, you lose credit for all of them.** That's the BAD news. The GOOD news is…you will LIKE the labs and they will be very good for you. The labs are where you get a chance to DO some science, including observations, calculations, analysis, etc. They are also a social, group-learning experience where we expect you to interact with your peers in both a learning and teaching capacity. If you find the work easy….help somebody else with it. If you find it difficult….get help from the lab TA or another class member. Getting the right answer on a lab will help you some, but understanding how you got the right answer will help you much more. The tests will have special emphasis on concepts covered in the labs. The labs are largely a group effort (although you will get graded individually) while the tests (unfortunately) are solos. See the main labs page for more detail about the labs.
Grading:

- Labs (including homework): 30%
- First Test: 15%
- Second Test: 20%
- Final Exam: 35%