Astrophysics

Physics 170, Spring 2018

The tools you have developed in the first two years of physics will be applied to explain a variety of astrophysical phenomena.

Page last updated Feb. 23, 2018.
The most current version of the syllabus is at
physics.stmarys-ca.edu/courses/Phys170/18S

INSTRUCTOR

- Prof. Brian Hill (follow link for additional info including office location and office hours)

COURSE MATERIALS

The author, Prof. Emeritus Thomas Swihart, of Quantitative Astronomy: Topics in Astrophysics died suddenly at the age of 65. As a result, instead of going through the typical series of updated editions since it was first published in 1992, his textbook is out-of-print. The textbook isn't loaded with the sidebars and color pictures that textbooks are now marketed with. It nonetheless remains highly suitable for our purposes, and fortunately copies are readily available used.

TOPICS AND SCHEDULE

We expect to cover Chapters 2-7 of the text at the rate of about one section per lecture. We will skip the preliminaries of Chapter 1 and return to them as necessary. This means that our topics are:

- Orbital Mechanics
- Tides and Eclipses
- Radiation and Matter
- The Planets
- Measuring the Stars
- The Theory of Stellar Atmospheres

ASSIGNMENTS AND EVALUATION

We are a small group. It will be important to actively read and participate in the class discussions. The assignments and evaluations will weight into the grade as follows:

- Homework: 20%
- Two Computational Projects: 10% each (total 20%)
- One Midterm to be held about the time we finish Radiation and Matter: 30%
- Final: 30%

The two computational projects will be of your own choosing. I will assist with the choices and create some guidelines for the solution. You may use any of the computational tools (e.g., MATLAB, Python, Mathematica, Java, C++) that you have learned in other courses.

The midterm and final will both adhere to exercises and problems that we are doing as part of the text. In other words, rather than test that you can sail into new territory with what you have learned, I will simply be testing that you have internalized the range of problems that Swihart sets us up to solve.