

## **Syllabus for ASTRONOMY 1110L and 2030L - Fall 2009**

**Instructor: Loris Magnani**

**Office: Physics 238**

**Office hours: Tuesday and Thursday 11:00 AM - noon; 1:00 PM - 2:00 PM**

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**Class times: Tuesday 8:00 PM - 10:45 PM**

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Welcome to the Physics and Astronomy Department's Honors Astronomy Laboratory, ASTR 1110L, and intro lab for majors, ASTR 2030L. Instead of the standard two-hour laboratory, which presents a different topic each week, we will spend the whole semester introducing you to optical astronomical observation.

We will observe a variety of astronomical objects using the University's 24-inch telescope on the roof of the Physics building. Since there is a limited amount of time, our observations will not be as well-developed or as sophisticated as those undertaken by our more senior Physics and Astronomy majors (especially as regards the data reduction). If you wish to do more serious work you are invited to take ASTR 3010, Astronomical Observations.

Some ground rules:

You will work in groups of 3 or 4 for safety reasons and because there are so many of you this semester... We automatically have the telescope signed up for our class for all Tuesday evenings during the semester. If you need additional time to make observations (because of cloudy weather), you will need to sign up for time on the telescope using the sign-up sheet on my door (Physics 238). If you sign up for additional time, and it is clear, you need to show up.

At first, we will all meet on Tuesday night to learn how to use the telescope and how to record and analyze the data. After you get checked out on the telescope you will come in and do the work yourself. I will be downstairs in my office during class time.

There are 9 possible projects that you can do. If you complete **5** or more of them your grade will be an A, **4** or **3** earns a B, **2** gets you C, and **1** a D. If you complete no project, then you will get an F. Pluses or minuses are determined based on the quality of the projects you turn in. For instance, if you do 3 projects and half or more of them (i.e., 2) are above average, I will give you a C+ instead of a C. If all the stuff you turn in is below average, then I will give you a minus. The projects will consist of observations of some astronomical object, a write-up including what you did, what the results were, any analysis leading to the result or calculation, and a brief description of what were the uncertainties in the procedure of calculation.

The projects (roughly in order of difficulty) are:

1. A gallery of interesting objects
2. The scale of the telescope
3. Double stars and resolution
4. The Mass of Jupiter and its Rotation
5. A Hunt for Galaxies
6. The Motion of Uranus and Neptune
7. The Mass of Uranus or Neptune
8. Asteroids
9. Finding Pluto.

The projects will consists of four sections: 1) the preparation, 2) the observations 3) the analysis 4) the write-up.

The preparation needs to be done before you get to the telescope so that you can use your time there efficiently. It basically consists of reading the writeup on the particular lab(s) you plan on doing. Most observing sessions should take an hour or two (although some projects will require that you make observations and record your data over multiple nights). As you get better you will observe more quickly. Before you start your analysis you should show your observations to me (you can send me your images as attachments to an e-mail, for instance) to make sure your data is good enough to get results. The analysis will often require some algebra and geometry. Make sure you understand the procedure spelled out in the individual lab instructions or you can go far astray. Make sure you understand enough about the process so that if you get a wild result you will know to go back and find where you made your mistake. Always consult with me if you are uncertain as to what you should do or how you should proceed.

You need to turn in the projects as soon as you write them up. The final date for everything to count toward a grade is the last day of classes, Friday, December 11, 2009. Anything turned in after that date will be ignored.