

AST 152M: Stellar Astronomy Lab

Fall 2012

Lab Instructors: Rodolfo Santana
Office, etc.: see AST 352K syllabus

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Class website: TBD

16-inch telescope manual: <http://outreach.as.utexas.edu/16inch>

Welcome to the Stellar Astronomy Lab. Previous or concurrent enrollment in AST 352K is strongly recommended. This lab course is designed to give students hands-on experience in the acquisition and analysis of astronomical data, while AST 352K emphasizes the physics of astronomical phenomena. We will focus on observations made with a 16" telescope located on the roof of RLM. Students will learn how to operate the telescope using the computerized control system to locate astronomical objects. Images will be acquired digitally by the students using a Charge-Couple Device (CCD) in the dome. Students will use current astronomical image processing software on the computers in the undergraduate computer lab (RLM 13th floor) to analyze their data from the telescope. We HOPE(!) to also have a spectrograph working on the telescope for your use by October. We gratefully acknowledge the excellent work of former grad student Dr. Amanda Bayless in setting up these labs. Her writeups will form the basis of our work.

Class Meetings

We will need to meet as a class from time to time. This will be a time for short lectures, discussion of material and labs, and distribution of hand-outs. As a class we will choose a time that is best for everyone and we will let you know at least a week in advance if we will meet the following week. Although the meetings may not be regular, they are still class time and as such should not be missed without a valid excuse.

Lab Groups

Learning to work well with each other is a very useful skill that you will certainly draw upon throughout your academic career and beyond. To cultivate this, much of the work you will do for this course will be in groups. Groups of 3-5 will be assigned based on the results of a questionnaire we will circulate on the first day.

Telescope Schedule

Everyone must attend the telescope orientation session before they will be allowed to use the equipment. This will be scheduled sometime during the third week of classes. Because the observations require clear weather, students are expected to be flexible in their time spent at the telescope and should recognize that observations may need to be made at unusual hours. Once the groups have been organized, each group can sign up for time on the telescope each week. Only one prime time slot (before 11 pm on any night) per week per group can be booked in advance. Unless a special announcement is made, the telescope will be available every night except Wednesday nights before 10pm. If a prime time slot is still free less than 24 hours ahead of time, any group can claim it, even if they have booked another prime time slot for that week in advance. Each group must use their prime time slot that they have booked, or must cancel more than 24 hours in advance. Times after 11pm are open to any group without restriction, but must be signed up for (with me) ahead of time. **Please send me an e-mail with all group members' names, the requested time, and a back-up time in case the first time is unavailable or you are rained out etc.** Cooperation in sharing the telescope by these guidelines is expected. Failure to comply will result in a lower grade for the lab in that segment. We will keep an updated schedule on the class website.

Each person must keep an observing log for each observing night. Necessary telescope information must include actual observers present, object observed, equipment used, and any problems that arose. Necessary astronomical information includes details such as exposure times, filters, time of exposure, filenames, etc. If a problem occurs that is not catastrophic to the health of an observer or the operation of the telescope, send an e-mail to us ASAP. If the telescope can not be stowed safely, call us. If someone is ill or hurt, call 911 then call us.

For safety reasons, no one is permitted to be alone on the RLM roof (18th floor) without at least one other member of either AST 152M or UT Astronomy staff present. We will provide a combination lock box giving students access to the key for the roof. These keys must be returned to the lock box after you are done using the equipment.

Data

You will ftp your data from the dome to an astronomy account that can be accessed from the computers in the 13th floor computer lab. It is your responsibility to make these back-ups. If you don't have an account on the computers, you will be provided with one.

Grading

The grade you receive in this course should reflect your mastery of the material, efforts to acquire new skills, and contributions you have made to the efforts of others in your group. We expect that your final lab grade will be based on the following break down.

10 points

Attendance at class meetings

There will be no make-up sessions. You are responsible for any material and handouts presented in class, whether you are present or not. Handouts will be available on Blackboard

5 points

Basic operation of the telescope

Each individual must demonstrate that he or she can safely use the telescope before using it to obtain data for the labs.

10 points

Observation log

Each **individual** must keep an observation log for each observation night. It should be turned in with short answer questions **individually**.

25 points

Short answer questions

There are questions at the end of the labs. These questions will test your understanding of the background material and lab activities and should be done **individually**.

50 points

Lab write-ups

Only one lab write-up will be submitted by each **group** as a collective effort and will be given a group grade (except for lab 5 which will be completed by each individual). Each group may organize themselves according to ability in different areas of expertise, but each member of the group should know the details of how all the individual contributions relate to the completed lab write-up. There are 5 labs at 10 points each. Any questions not in the Question section can be answered as a group.

The final grade will correspond roughly to the following scale, but may change (for the better) if needed.

A=90-100 points B=80-89 points C=70-79 points