ASTR 410/510, Observational Astrophysics, Spring '08 **HANDOUT #1**

COURSE REQUIREMENTS AND SYLLABUS

PROFESSOR AND OFFICE HOURS

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WEB SITE: `http://www.phy.ohiou.edu/~tss/ASTR410/`

COURSE STRUCTURE

The purpose of this course is to take you through the entire process of observational astronomy, from the conception and proposal stage, through the detailed planning and execution of the observations, to the data reduction, scientific interpretation, and dissemination of the results.

Each student will be expected to:

1. **Conceive his/her own project.** Any observational project is acceptible, within the following parameters:
   a. *The goal of the project must be a quantitative scientific measurement.* Projects whose sole purpose is to produce a "pretty picture" are not acceptible. However, obtaining a photogenic image as a byproduct of the main science goal can make a good project better.
   b. *The measurement must be non-trivial and justifiably interesting.* A project to measure the visual magnitude of some particular star, for example, would not be interesting. On the other hand, if the star were an eclipsing binary, a project to measure the light curve through the eclipse *would* be interesting (as well as highly non-trivial!).
   c. *The project must be doable with the available equipment.* Current equipment consists of a 0.25 meter telescope, a direct imaging CCD, broadband B, V, R, and I filters, and a narrow-band Hα filter. Spectroscopic projects are impossible at present.
   d. *The project must be doable in the available time.* Projects to observe objects that are not visible in April or May of this year are not acceptible, as are projects requiring long-term monitoring or repeated observations over a long baseline.
2. **Write an observing proposal.** The proposal lays out the motivation and basic plan of the project, and demonstrates how the project can be completed successfully.
3. **Participate in a proposal review.** The class will convene as a Time Allocation Committee (TAC) to review the submitted proposals and schedule the observations.
4. **Carry out the observations.** The techniques for operating the equipment and manipulating the data will be covered in class and evening practice sessions. Observations will be done at sites to be determined, on clear nights as they become available.
5. **Reduce and analyze the data.** Use of the reduction and analysis software on the workstations in the Physics & Astronomy Department will be covered in class and online documents.
6. **Write up the results.** Short papers, written in HTML, should describe the motivation, observations, and results of the project. The format and other requirements will be discussed in class and online documents.
7. **Deliver an oral presentation.** The class will hold a mock meeting of the AAS during the final exam period, consisting of five-minute oral presentations on each project, plus time for questions.

GRADES

Grades will be based in equal measure on the observing proposal, HTML write-up, and oral presentation, with the written review produced for the TAC meeting contributing an additional half-share. There will be no penalty if a project fails to produce the desired science because of unforseen technical problems, as long as the write-up and talk address the reason for the failure and suggest steps that can be taken to avoid similar problems in the future. Allowances will also be made in the event of unrelentingly bad weather; however, students are expected to take advantage of all usable nights to complete their projects. Bad results stemming from *avoidable* errors, such as poor planning, poor execution of the plan, or faulty analysis, can lead to a low grade in the course. The professor will keep students apprised during the quarter of their likely grades based on progress to date.

COLLABORATIVE PROJECTS

Joint projects, with responsibility and credit shared equally between two co-investigators (co-Is), are acceptible *only* if the project meets one of the following conditions:

1. The co-Is are proposing to obtain two *distinctly different* scientific results from the same observational data; or
2. The co-I's are proposing to combine results from two *distinctly different* observations in order to obtain a new result that could not be obtained from either observation alone.

In either case, each co-I should write his/her own proposal, explaining the division of responsibilities in the collaboration and how the proposal is linked with its counterpart. Collaborations whose sole purpose is to reduce the workload on a single-person project and collaborations of more than 2 co-Is are not acceptible.

STUDENT RESPONSIBILITIES ON OBSERVING NIGHTS

Because of the difficulties in transporting large amounts of equipment to the observing site and the scarcity of clear nights in Ohio, every effort will be made in this course to optimize the use of observing nights. This means:

- An observing night lasts *all night* (from before sunset until after sunrise) unless weather conditions make this impossible;
- Each observing night is a *team effort*, and all students taking data on a particular night are expected to help with all phases of the observing, including transportation, set-up, and tear-down.

DIFFERENCES BETWEEN 410 AND 510

Graduate students enrolled in ASTR 510 will be expected to read background material on their projects from the published astronomical literature, including peer-reviewed journals; to make use of this material in their observing proposals and final write-ups and oral presentations; and to cite the sources as per standard practice in the field. Undergraduates in 410 may make use of textbook sources instead of research papers, but must still credit their sources appropriately.

UNIVERSITY POLICY ON ACADEMIC CONDUCT

Cheating in any form will not be tolerated. Cheating is a Code A violation of the Ohio University Code of Student Conduct, and can result in an F grade for an exam or for the course, and/or a referral to the Director of Judiciaries with the possible sanctions of suspension or expulsion. For the purposes of this course, "cheating" specifically includes falsification of data as well as plagiarism or any other uncredited use of another person's work.