A305 - Lab Options

Six laboratory exercises must be completed for A305, selected from among the options listed below. Specific instructions are available for each lab on the course website at www.astro.indiana.edu/~classweb/a305_f07

You may choose any of the lab options listed to complete for the course, but some labs are required. All students must complete Lab #1 (Kirkwood Observatory). Labs 5 (CCD Imaging) and 6 (Basic CCD Reductions) are required for students who wish to receive an A in the course. The requirements for each lab are included in the specific instructions for the lab. Also review carefully the comments on this handout.

DUE DATES: One laboratory exercise must be handed in on or before each of the following dates:

Friday, 13 September - Kirkwood Obs. Lab REQUIRED
Friday, 27 September
Friday, 11 October
Friday, 25 October
Friday, 8 November
Friday, 29 November

Rules and Regs:
- All observing labs must be conducted in compliance with SAFETY PROCEDURES. Failure to follow safety procedures will cause you to lose access to the telescopes.
- Labs may be completed with a partner or partners, but each student should hand in a complete, original lab report written by himself or herself. Lab reports that are plagiarized will be returned without a grade.
- Late lab reports will only receive partial credit.

Facilities:
- Kirkwood Observatory and our two rooftop "go to" telescopes, Sunrise and Sunset, are available for student use for A305 labs.
- Other telescopes that we may use are the WIYN 0.9-m telescope at Kitt Peak (through remote observing) and the 1.25-m automated telescope in the Morgan-Monroe State Forest.
- The Mac computer cluster in Swain West 246 will be available for use in completing labs. The IRAF (Image Reduction and Analysis Facility) software is available on these computers, and your lab instructors will assist you in learning IRAF. Accounts have been set up for you and you will need to obtain a key card to access the computer lab.
- Documentation will also be available for your use in SW 246.
Lab Instructors:
- Lab instructors (Mike and Randy) will be available Monday through Friday for three hours each evening. The time of the open lab period will be from 9 PM until midnight at the beginning of the semester, but will shift earlier as the season progresses. Lab instructors may also be available at other times by special arrangement, especially for solar labs.
- Most of these labs will require some detailed help from one of the instructors, so plan ahead, and don't leave them until the last minute.

Data:
Some labs involve data you will obtain from telescopes available for use by the class. Other labs will use of specific data can be found in the shared A305 directory on the 246A cluster. Other labs require data obtained at the WIYN 0.9-m or at the 1.25-m telescope in the MMSF.

Good Advice
- The goals of the lab assignments are to help you learn basic observing techniques and to learn to solve problems yourself. Do not expect these to be "cookbook" labs. You are expected to think about the tasks you are to complete in each lab and to develop reasonable procedures to accomplish those tasks. You are expected to try to find solutions to problems yourself.
- The Lab Instructors will be available to help you, but their job is to help you learn to figure out the answers yourself, not to hand you the answers.
- Think through what you will need to do in advance. Work in groups and problem-solve together.
- Come to evening labs prepared - read the lab assignment and bring a copy. Plan at least two, and possibly three evening sessions to complete each lab.
- When you make measurements, always to a "gut check." Does your measurement make sense? Is it consistent with other things you know?

WARNINGS:
- Appropriate use of significant figures is required on all lab reports.
- Estimates of uncertainties are also required for all measured quantities, and an explanation of how the stated uncertainties are determined must be included.
- Inappropriate use of significant figures or missing uncertainties or explanations will result in a lower grade.
- Spelling and grammar errors make your work look unprofessional. Lab reports will be marked down for poor spelling or grammar.
Lab Options for A305

Lab 1: Kirkwood Observatory 12" Refractor (REQUIRED FOR ALL STUDENTS)

Lab 2: Observing the Sun at Kirkwood Observatory

Lab 3: Basic Use of the Rooftop GoTos

Lab 4: Advanced Use of the Rooftop GoTos

Lab 5: CCD Imaging with the Rooftop GoTos (REQUIRED FOR AN "A" GRADE)

Lab 6: Basic CCD Reductions (requires rooftop or 0.9-m data) (REQUIRED FOR AN "A" GRADE)

Lab 7: Eclipse Timing for an Algol Binary Star (requires rooftop data)

Lab 8: Finding Dusty Disks with Spitzer

Lab 9: Determining the Composition of the Sun

Lab 10: Measuring the Velocity Dispersion of M13

Lab 11: Pretty Pictures (requires rooftop or 0.9-m data)

Lab 12: Service Learning at Kirkwood Observatory

Lab 13/14: Observing Proposal for the WIYN 0.9-m and Reduction and Analysis of 0.9-m Data

Lab 15/16: Observing Proposal for the 1.25-m Telescope and Reduction and Analysis of 1.25-m Data

Lab 17: Special Project (with permission only)