

AST 112: Astronomy Lab

Spring 2024

Instructor Information

Course Supervisor: Prof. Jin Koda (Email: jin.koda@stonybrook.edu)

Instructor: Evan Saraivanov

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Class Information

Dates: Tuesdays

Time: 5:30 PM - 8:20 PM

Classroom: Physics A-128

Office Hours: Wednesdays 11:00 - 12:30 in ESS 437 (also for AST 101)

Course Description

This course provides an introduction to observational activities in astronomy. Students make astronomical measurements using simple instruments such as a quadrant, cross-staff, spectrometer, and telescope; analyze measurements; examine how quantities of interest and their errors are derived from the measurements and how they are properly reported. Most experiments are held indoors in a classroom with some outdoor observational activities. This course is not for astronomy major credit.

Course Objectives

1. Students will be acquainted with some of the techniques, equipment, and measurements that historical and modern astronomers have used, and are using, in their research.
2. Students will be introduced to observational sessions wherein telescopes will be used to give hands-on experience of astronomy.
3. Students will demonstrate how to analyze and interpret data.

Reference Textbook

Textbook is not required. All course materials will be distributed online through Brightspace or as hard copies in class.

Instruction Material & Software

The instruction material will be distributed to students one week before each experiment on Brightspace. Students should follow the distributed material.

Software: A basic scientific calculator that can do trigonometry should be enough for data analysis, and you can manually plot data on a graph paper. You can also use your computer/school provided software suites for data analysis and graphs.

Lab Notebook or Computer: You will need a lab notebook (graph paper style) to use during lab sessions when recording measurements. You can also record the data in your laptop.

Grading

There will be 12 labs in total (3 observational and 9 others). One observational lab (The Lunar Characteristic lab) is under the semester-long project moon lab. The course grade is determined by the following components of a point-based system:

Reports	10 points ($\times 11 = 110$ points)
Moon Lab	10 points

The total possible points is 120. There will be no end-semester exam. **No additional points will be offered under any circumstance.**

Challenges of any grade must be made within 7 business days of the posting of the grade. No changes will be made to a grade after that time, regardless of the cause.

Labs & Reports

Some weeks we will have a lab and some weeks we will have a discussion and a small problem set to solve in class. Each lab or problem set will have an associated **report or assignment to be turned in no later than the beginning of the next lab session**. Each lab report will be worth 10 points. **Late lab reports received within 24 hours of the due date/time will be assessed a 20% penalty. No late report will be accepted after that 24-hour window.**

You need to submit your lab report in Brightspace. You can either snap a picture of your lab book and upload it in PDF format, or type it in your computer and upload it in PDF format. We will not accept in-person submission.

Each lab will be completed with your lab group, but all lab group members must write and turn in their own original report. **Data is shared by the group and the analysis may be done together, but the report writing is an individual task.** A rubric will be provided describing required layout and content for the reports.

Moon Lab

The Lunar Characteristic lab consists of a class lecture followed by a semester-long individual project worth 10 points. This lab requires a semester-long planning by students at the beginning of semester, and be aware that students can lose the full 10 scores if they do not plan. A handout will be provided in class.

Make-up Lab

You are expected to be on time to the lab sessions and properly prepared to start class. There is little time in the semester to reschedule a missed lab, but if permissible circumstances (like medical absence, jury date, military service) arise you should **e-mail the instructor and course supervisor before** the scheduled lab date. In this case, you need to submit an official document evidencing the reason of absence (like an official doctor's note, official document of jury date or military service).

Notification after a missed lab will be judged on a case-by-case basis, but the student should not expect any make-up automatically granted in this case. There is only room for one make-up lab, and as such, **you can only miss one lab date during the semester.** The make-up lab will be graded in place of the lab you missed. You will not be allowed to make up more than one lab **under any circumstances**, thus any missed lab after the first will yield zero points.

Brightspace

All students must regularly monitor Brightspace for notices and changes to course information, including the syllabus. All documents regarding the course and exam scores will regularly be posted on Brightspace. **All rescheduling will be announced on Brightspace.**

Schedule

The following is a tentative schedule for the lab course. As astronomy is observational by nature, any observing labs are dependent on good weather. In the event an observing lab must be rescheduled, you should prepare for the following lab that will replace it. **Students should always be prepared for a sudden observing session.** We will discuss this in detail later.

Date	Lab Topic
Jan 23	No Lab
Jan 30	Overview & Math Review
Feb 6	The Cross Staff and Parallax
Feb 13	Observing Lab: Lunar Characteristics (Moon Lab)
Feb 20	Lenses and Telescopes
Feb 27	Observing Lab: Telescope Usage
Mar 5	Solar System
Mar 12	Spring Break
Mar 19	Stellar Properties, the HR Diagram
Mar 26	Observing Lab: Spring Constellations
Apr 2	Luminosity, Brightness, and Distances
Apr 9	Kepler's Laws, Mass of Jupiter and Saturn
Apr 16	Stars, Light, and Spectra
Apr 23	Hubble's Law and the Age of the Universe
Apr 30	Make-up Lab Date

Changes to the Syllabus

Every effort will be made to avoid changing the course schedule, but the possibility exists that unforeseen (e.g. weather) events will make syllabus changes necessary. It is your responsibility to check Brightspace for corrections or updates to the syllabus. Any changes will be clearly noted in course announcements or through Stony Brook email.

Student Accessibility Support Center Statement

If you have a physical, psychological, medical, or learning disability that may impact your course work, please contact the Student Accessibility Support Center, Stony Brook Union Suite 107, (631) 632-6748, or at sasc@stonybrook.edu. They will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential.

Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and the Student Accessibility Support Center. For procedures and information, go to the following website: <https://ehs.stonybrook.edu/programs/fire-safety/emergency-evacuation/evacuation-guide-people-physical-disabilities> and search Fire Safety and Evacuation and Disabilities.

Academic Integrity Statement

Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty is required to report any suspected instances of academic dishonesty to the Academic Judiciary. Faculty in the Health Sciences Center (School of Health Technology Management, Nursing, Social Welfare, Dental Medicine) and School of Medicine are required to follow their

school-specific procedures. For more comprehensive information on academic integrity, including categories of academic dishonesty please refer to the academic judiciary website at http://www.stonybrook.edu/commcms/academic_integrity/index.html.

Critical Incident Management

Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of Student Conduct and Community Standards any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn. Faculty in the HSC Schools and the School of Medicine are required to follow their school-specific procedures. Further information about most academic matters can be found in the Undergraduate Bulletin, the Undergraduate Class Schedule, and the Faculty-Employee Handbook.