

INQ 250L: Astronomy Controversies Lab Fall-2025

Instructor: Dr. Truong Le

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Lectures Room: Trexler Hall, 274

Lectures Time: TH 1:10-4:10 pm

Office Hrs: MW (10-12:00 pm), and by appointment

Course Description: This is a laboratory class accompanying INQ250. This laboratory is required to receive credit for INQ205.

Textbook and Materials: Lab instructions will be handed out at the start of each lab meeting. Please bring pencil and calculator to each lab meeting.

Laboratory: You must be enrolled in the laboratory portion INQ 250L of this course. Although INQ 250L operates as a separate course, it counts as 20% of the course grade for INQ 250. Please refer to the lab course syllabus for important information about the lab specifics and final grade.

Learning Outcomes: After the successful completion of this class, the students will be able to:

- Design and carry out measurements based on the directions given by the lab instructor and in the experimental manual.
- Collect data and tabulate it with appropriate units and significant figures.
- Draw sketches, graphs, etc. and use them to analyze data.
- Estimate uncertainties associated with the measurements.
- Discuss results and compare with available accepted values.
- Use computer software (Microsoft Word, Microsoft Excel, etc.) to collect data and create graphs, report observations, and tabulate results.
- Apply appropriate methods of safely handling equipment and performing laboratory procedures.
- Setup, align, and operate an 8" reflecting telescope.

Lab Partners: Group (team) study will be arranged to develop skills/strategies to carry out the experiments. Each team has the right to expel a member from the team if that individual does not contribute in any effort of the work. It is up to the team to except that individual back into their team. Otherwise, that individual will be by himself or herself until the next new arrangement. New team arrangement may occur after every four labs. Working on an experiment by yourself is extremely difficult.

Quizzes & Worksheets: A quiz will be given after every lab (sometime as group and sometime as individual). There will be no make-up for these quizzes. The quizzes will be graded for correctness. The worksheet is to be submitted ONLY when a quiz is not given. The worksheet grades will be determined by the clarity and accuracy of your responses to the questions on the worksheet you will complete in lab. Note that your lab data does not need to be perfect for you to earn a high lab grade. (In fact, if it is too perfect, I may be suspicious of the data.) However, you must account for any irregularities in your data with clear and plausible explanations. Unless otherwise instructed, each worksheet question must be answered in complete sentences. In addition, all numerical values should have the correct physical units (if applicable) and an appropriate number of significant digits. Everyone will need to turn in their worksheet.

Grading: LabReport (Group)/Quiz (Individual) - 100%

Attendance/Participation in Discussion: Attendance is mandatory. NO make-up labs will be offered at the end of the semester; one lab will be dropped. This is intended to cover all possible reasons you might need to make up a lab, including absences or poor grades. If you miss more than one lab your grade will almost inevitably suffer. Please be polite to your team by being on time. If you are 30 minutes tardy to class, I will deduct one letter grade from your lab's report. If it happens twice two letter grade will be deducted from your lab's report. If it happens three times, I will ask you to leave the class and you will receive a 0 for that lab.

Laboratory Behaviors: The lab will start promptly on the hour. You are requested to show up on time for the start of the lab. Please set cell phones to vibrate before the lab. Eating and drinking in classroom are NOT ALLOWED. Please eat outside of class. The instructor has the right and the authority to expel anyone who disrupts the class or behaves inappropriately at any time.

Accessible Education Services (AES): Located in the Goode-Pasfield Center for Learning and Teaching in Fintel Library. AES provides reasonable accommodations to students with documented disabilities. To register for services, students must self-identify to AES, complete the registration process, and provide current documentation of a disability along with recommendations from the qualified specialist. Please contact Becky Harman, Assistant Director of Academic Services for Accessible Education, at 540-375-2247 or by e-mail at aes@roanoke.edu to schedule an appointment.

Academic Integrity: Your learning and integrity are at the core of your RC education. For this reason, you must follow the College's Academic Integrity policies: you can find the policies and resources online at https://www.roanoke.edu/inside/academic_affairs/academic_integrity (← clickable link).

Collaboration is an important skill, and you are encouraged to collaborate on assignments. Specifically, you will collaborate with your group on labs and sometime on quizzes.

Quizzes are open-notes based on your lab worksheets. Electronic devices (other than calculators) are NOT permitted during quizzes. Communication between students regarding quiz content is prohibited until all students have completed the quiz.

If I become aware of a possible violation of these guidelines, I am contractually obligated to report it to the Academic Integrity committee.

Course Schedule: Lab activities

Dates	Lab
Aug 28	No lab first week
Sep 4	1. Scale the solar system
Sep 11	2. AngularSize-FieldofView
Sep 18	3. Outdoor/Telescope
Sep 25	4. Night Observation
Oct 2	5. Kepler Laws
Oct 9	6. Extrasolar Planets
Oct 23	7. Planck Radiation
Oct 30	8. Black Hole
Nov 6	9. Hubble Deep Field
Nov 13	10. Dark Matter
Nov 20	11. Speed/Image of a Galaxy
Dec 4	12. Project Presentation

I have read and understood this syllabus. Sign, date, and submit this page for 10 points toward your participation grade on your first day of class.

Student's Name (First and Last)

Date