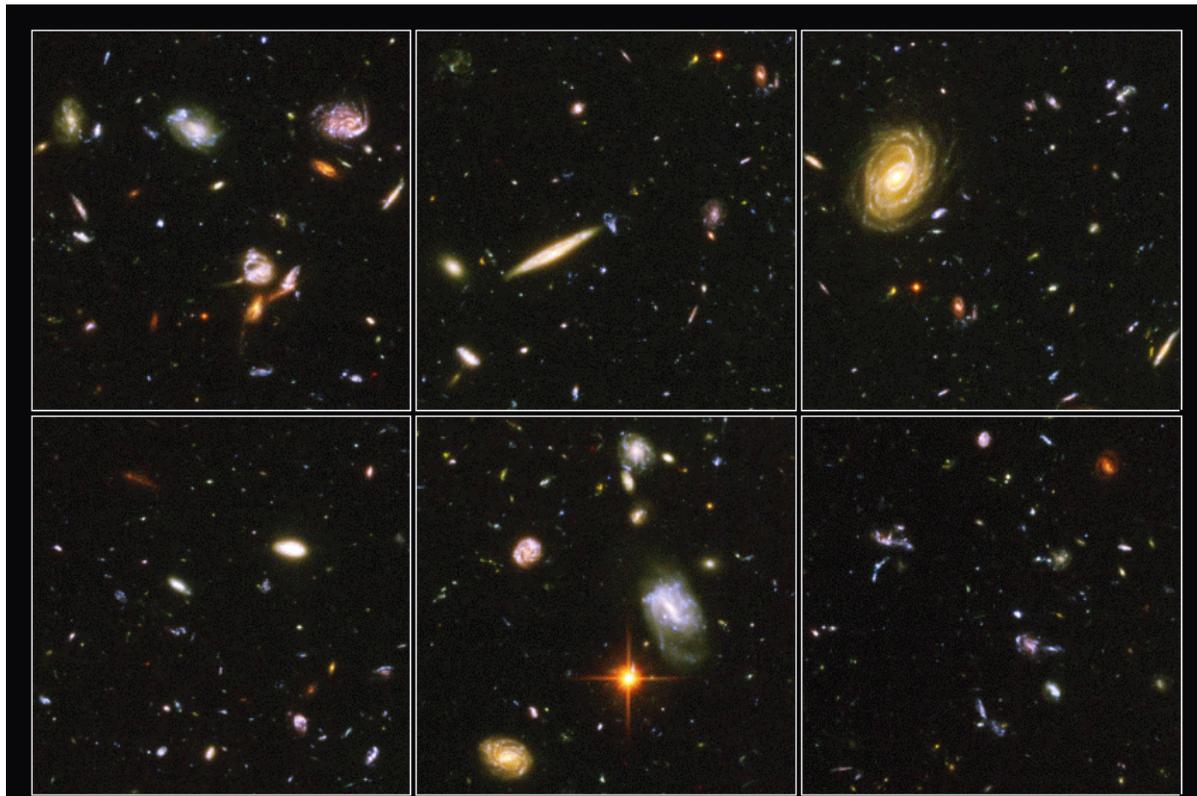


Astro 376R (Fall 2021, Unique 48355)

A Practical Introduction to Research



Current Announcements

- Welcome to Astro 376R, "A Practical Introduction to Research" -- a course designed for science and engineering majors. This **class website is the one stop shop** where announcements and the vast majority of class materials (e.g., zoom links for class and office hours, video recordings of lectures; homeworks and other assignments) will be posted, so please bookmark it and visit it regularly.
- We are in the midst of an unprecedented pandemic that is challenging our learning, teaching, and research activities. **To help us provide safe in-person classes, please follow the [Classroom Safety and COVID-19 protocol](#).** Please also remember that we are all in this together and it is important that **we all show extra compassion, empathy and flexibility** while everyone navigates different individual challenges. All students in this class: please know that we (the professor and teaching assistant of this class) are here to support you in every way we can. Please do not hesitate to reach out to [Professor Shardha Jogee](#) (email: sj@astro.as.utexas.edu) if you are having difficulties.
- Below are some quick links for frequently accessed parts of this website. You will need the id and password given in class to access some of the secure material on the

website.

- [Course Syllabus](#) (this is a printout of this website on the first day of class)
- [Course Prerequisites](#)
- [Course Description](#)
- [Class Policy and Office Hours](#)
- [Classroom Safety and COVID-19](#)
- [Repository of Selected Material from Lectures & Assignments](#)
- [Zoom links for class and office hours.](#)
- [Course Outline/Calendar](#)
- [Course Assignments and Grade](#)
- [Extra Class Resources](#)
- [Astronomy Picture of the Day!](#)

Course Syllabus and Overview

Course Prerequisites: This class is restricted to science and engineering majors and class prerequisites are "Mathematics 305G or the equivalent". Prior computing experience and an introductory astronomy course, such as AST 307, are recommended, but not required. If you have not taken any introductory astronomy course, I recommend that you review an introductory level textbook on astronomy that covers the basics of astronomical units, stars, and galaxies. While the course can be taken by any eligible student, we will give first priority to undergraduate majors in Astronomy and Physics, who are in their **Freshman and Sophomore years** in order to facilitate their involvement and progress in research.

Course Description: Astronomy 376R, "A Practical Introduction to Research" is designed for science and engineering majors. It aims at equipping undergraduates with many of the skills relevant for research projects in astronomy and astrophysics, in order to facilitate their involvement in the [College of Natural Science Freshman Research Initiative \(FRI\)](#), as well as in more [advanced individual research projects](#) during their sophomore to senior years, and external [National Science Foundation \(NSF\) Research Experiences for Undergraduates](#). This course may be counted toward the quantitative reasoning flag requirement and the independent inquiry flag requirement. Many of the skills you will learn are required for [currently offered research projects in Astronomy](#) and some skills be useful well beyond research in your undergraduate years, during graduate school in astronomy or astrophysics, or jobs in industry, national observatories, space science centers, etc. Topics to be covered include:

- Navigating the Research Landscape (e.g., The Scientific Method, Importance of Research, Types of Research, Funding, Research Team Members, Ethics).
- Getting Involved in Research at UT Austin and Beyond.

- Basics of the Mac OSX/Linux Operating System and Useful Command Line Operations.
- Programming in Python or IDL (e.g., Arrays, Functions, Reading and Writing Files, Control Statements, Plotting, Statistical Analyses, Astropy, etc). This module used to be taught in IDL, but we now teach it using the Python programming language.
- Effective Science Communication (Literature Search, Making Posters, Giving Different Types of Talks, Writing Papers, etc).
- Using LaTeX to Write Scientific Papers (including a Research Note for the AAS and an ASP conference paper).
- UG Research Presentations and Sharing our Research Journeys.
- Establishing Yourself as a Researcher (Projects, Publications, CV, Networking, etc).
- Careers in STEM -- visit from the UT Career Design Center & Career panels
- Graduate School: What is it about? Applying to US + European programs.

Class Policy and Office Hours

1. The instructor for this class is [Professor Shardha Jogee](#) and the teaching assistant (TA) is graduate student **Junehyoung Jeon**. This class will meet weekly on Tuesday and Thursday from 3:30 pm to 5:00 pm. The current plan is for this class to meet **in person at reduced social density in the UG computer lab PMA 15.201**, but the class modality may temporarily change to virtual mode if warranted by university health and safety protocols.
2. **To help us provide safe in-person classes, we ask all students to please follow the [Classroom Safety and COVID-19 protocol](#).** This is a hands-on highly interactive class with a large number of in-class activities, so students will get the most from this class by attending in person. We ask students to try to attend class in person for more effective instruction as long as you feel safe doing so. If you cannot attend the class in person, please email [Student Emergency Services \(SES\)](#) or/and the [UT Austin Services for Students with Disabilities \(SSD\)](#) to request an accommodation and they will contact the professor. We will do our best to support you and provide a safe and effective learning environment. To provide added flexibility for students who might have [to self-quarantine or self-isolate](#), we plan to display the slides on zoom even during in-person lectures and to post zoom-recorded lectures on the [class repository](#). Please see [this file for relevant zoom links](#) and please do not share these zoom links with anyone not taking this class. If you have to temporarily take the class on zoom, I ask that you please turn the zoom camera on and attend the class in synchronous mode (i.e., at the time it is offered). We will take attendance in person and over zoom to reward and track participation, which is part of the course grade.

3. We will use a [seating layout](#) to keep track of the seat numbers of students and make a **seating chart** for every lecture. We ask students to pick and keep a fixed seat for the whole semester if they are comfortable doing so in order to keep a stable seating chart. The seating chart will enable the university health services to rapidly perform contact tracing if a class member is exposed to or infected with the COVID-19 virus. Please see the [Classroom Safety and COVID-19](#) protocol for more details.
4. To provide added flexibility during the COVID-19 pandemic, students in this class will not be using the hard-wired desktops in the UG computer research lab. Instead, the University is **loaning each AST 376R student a MacBook Pro laptop** on which software relevant for AST 376R has been pre-installed. The use of these laptops will enable greater flexibility in the event that one or more class members have to temporarily attend class in virtual mode. The laptops will be distributed in class during the first week of class. **Please carefully read the [instructions provided by the CNS IT team](#)** on how to log on, use the laptop responsibly, and get help. It is **your responsibility to return the laptop back to UT Austin in good condition at the end of the semester.**
5. If you have any questions, please consult the professor and TA during the office hours listed below, or by appointment, and we will be glad to help. We are here to support you in every way we can. Office hours will be held **by default on zoom** in order to provide maximal flexibility to students. However, we can also meet students in person if the latter modality is more appropriate for the topic of the meeting. We request that students please give 24 hours advance notice to the professor and TA if they want to meet in person during a particular week.

Name: Prof. Shardha Jogee	Junehyoung Jeon
Office: PMA 15.326	PMA 17.314
Hours: Mon. 10:00 to 11:00 am	Wed. 11:00 am to noon
Zoom: See this file	See this file
Email: sj@astro.as.utexas.edu	junehyoungjeon@utexas.edu

6. You can also email the TA or professor if you need help. Please allow up to one business day for a response and note that emails sent over the weekend or after business hours (Monday to Friday from 9:00 am to 5:00 pm when the University is open) will receive an answer by the next business day.

Classroom Safety and COVID-19

We are in the midst of an unprecedented pandemic that is challenging our learning, teaching, and research activities. Please remember that we are all in this together and it is important that **we all show extra compassion, empathy and flexibility**

while everyone navigates different individual challenges To help preserve our in-person learning environment, the university recommends the following:

1. Adhere to university [mask guidance](#). While the University does not have a mask mandate, **masks are strongly recommended inside university buildings** for vaccinated and unvaccinated individuals, except when alone in a private office or single-occupant cubicle. According to the national [Centers for Disease Control and Prevention \(CDC\)](#), masks can help protect from the Delta variant and prevent possible spread to others.
2. [Vaccinations are widely available](#), free and not billed to health insurance. The vaccines authorized by the U.S. Food and Drug Administration are safe, effective and will allow us the best chance to have a safe fall semester. The vaccines help protect against the transmission of the virus to others, reduce serious symptoms, and help prevent illness and death in those who are vaccinated. **All eligible UT students, faculty, and staff members are encouraged to get vaccinated.**
3. [Proactive Community Testing](#) remains an important part of the university's efforts to protect our community. Tests are fast and free.
4. The university has determined that all students coming to campus for the fall semester must receive a viral COVID-19 test in their local community within 72 hours prior to arrival in Austin for move in. If they already reside in Austin, they must test within 72 hours of moving into the residence where they will reside for the academic semester. Finally, individuals who are already living in the residence in Austin where they will reside this academic semester should test within 72 hours (3 days) prior to the start of class on Aug. 25.
5. We encourage the use of the [Protect Texas App](#) each day prior to coming to campus.
6. If you develop COVID-19 symptoms or feel sick, stay home and contact the [University Health Services'](#) Nurse Advice Line at 512-475-6877. If you need to be absent from class, contact [Student Emergency Services \(SES\)](#) and they will notify your professors. In addition, to help understand what to do if you have been had close contact with someone who tested positive for COVID-19, see this [University Health Services link](#).
7. Students who test positive should contact [BCCAL](#) or self-report (if tested off campus) to [University Health Services](#).
8. As described under [Class Policy](#), we will use a [seating layout](#) to keep track of the seat numbers of students and make a **seating chart** for every lecture. We ask students to pick and keep a fixed seat for the whole semester if they are comfortable doing so in order to keep a stable seating chart. The seating chart will enable the university health services to rapidly perform contact tracing if a class member is exposed to or infected with the COVID-19 virus.
9. If you need mental health services please take advantage of [the mental health resources for UT students](#) and other services offered by the university

[Counseling and Mental Health Center.](#)

10. [Behavior Concerns and COVID-19 Advice Line](#) (BCCAL) remains available as the primary tool to address questions or concerns from the university community about COVID-19.
11. Visit [Protect Texas Together](#) for more information.

Course Calendar: The [course outline/calendar](#) provides an approximate sequencing of topics to be covered in class. There may be schedule adjustments based on the learning curve of the class and circumstances tied to the pandemic. The course outline will be updated regularly and the most current version can be found on the class website at the above link. Note that as outlined in the [Memo to Undergraduate Astronomy Students regarding Astronomy Courses](#), the professor is a professional astronomer and researcher who has professional responsibilities and may be occasionally be away for reasons tied to these responsibilities (e.g., to participate in international scientific panels and meetings, to present research talks at conferences, etc). In such cases, there may be a schedule change and an appropriate replacement lecture or other assignment will be scheduled.

Textbook and Reading: There is no single textbook that covers the wide variety of topics, which this course will span. We will provide our own tailor-made tutorials and online background reading material, which will be posted on the [class repository](#).

Course Assignments and Grade: Please submit your assignments on [Canvas](#) using the [instructions provided](#) unless otherwise indicated. Your grades will be posted online on [Canvas](#). I strongly recommend that you attend class as the assignments are primarily based on the lectures and related activities. We will take attendance in person and over zoom to reward and track participation, which is part of the course grade. There will be no exams and the final grade will consist of:

80% Homeworks and Projects

20% In-Class Activities and Participation (or equivalent)

When converting your final numerical scores to letter grades, I will use the scheme below or one that is more lenient.

Letter Grade	Grade Points	Numerical Score
A	4.00	91% to 100%
A-	3.67	86% to 90%
B+	3.33	81% to 85%
B	3.00	76% to 80%
B-	2.67	71% to 75%
C+	2.33	66% to 70%
C	2.00	61% to 65%
C-	1.67	56% to 60%
D+	1.33	51% to 55%

D	1.00	46% to 50%
D-	0.67	41% to 45%
F	0.00	0% to 40%

Additional Class and University Policies

In addition to the class and university policies outlined in the above sections of this webpage, particularly [Classroom Safety and COVID-19](#), [Class Policy and Office Hours](#), and [Course Assignments and Grade](#), the following additional policies apply:

1. **You All Belong Here:** A climate conducive to learning and creating knowledge is the right of every person in our community. As per [UT Austin policy](#), we are committed to providing an educational and working environment that is free of unlawful discrimination, including discrimination on the basis of race, color, religion, national origin, sex, pregnancy, age, disability, citizenship, veteran status, and genetic information. If you have any concerns, please contact me and when appropriate, please report to UT contacts on [nondiscrimination-policy](#) or [sexual harassment and misconduct](#).
2. Students with disabilities or special circumstances may request appropriate academic accommodations from the [UT Austin Services for Students with Disabilities \(SSD\)](#).
3. Please contact the [Behavior Concerns and COVID-19 Advice Line \(BCCAL\)](#) (phone: 512-232-5050) to address concerns about COVID-19 or another individual's behavior.
4. Please turn off your cell phone before the start of class unless you are using it to zoom into the class.
5. If you need to be absent from class due to an emergency, such as having COVID-19 symptoms or having a positive COVID-19 test, please contact [Student Emergency Services \(SES\)](#) and they will notify your professors. If you need to be absent from class for other reasons, please email the TA and professor with a valid reason and present some official supporting document (e.g., a note from SES or another academic administrator). If you miss class please review materials you missed on the class [repository](#).
6. As per [UT Austin policy](#) a student who misses classes or other required activities, including examinations, for the observance of a religious holy day should inform the instructor as far in advance of the absence as possible so that arrangements can be made to complete an assignment within a reasonable period after the absence.
7. Late homeworks will be accepted for partial credit **provided that you have been granted an extension prior to the due date**. In that case we will apply a 10% deduction for every 24 hours (e.g., a homework submitted 12 hours late will have a 5% deduction and receive 95% credit). Requests for correction or re-grade of an assignment (homework, exam or quiz) will be accepted at latest two weeks after it is handed back to you.

8. **Cheating will be severely punished** and I will consider filing a report to the [Office of the Dean of Students](#) for any student who cheats. If you submit work that is not primarily done by you or/and that you cannot explain, this will be considered as cheating. If you copy someone's assignment, exam, or quiz or if you let someone copy yours, both of you will receive zero credit and be responsible for cheating. In particular, note that **you must independently write up your assignments and you must be able to explain every step of your work if asked to do so**. You are encouraged to study with other students as long as you abide by this principle. If you use a private tutor to help you, please make sure that the bulk of each assignment is done by you and that you can explain every step of your work if asked to do so. The TA and professor reserve the right to ask any student to explain his/her answers and methodology on any assignment before assigning a final score for that assignment.
9. **Sharing of Course Materials is Prohibited** No materials used in this class, including, but not limited to, lecture hand-outs, videos, assessments (quizzes, exams, papers, projects, homework assignments), in-class materials, review sheets, and additional problem sets, may be shared online or with anyone outside of the class unless you have the instructor's explicit, written permission. Unauthorized sharing of materials promotes cheating. It is a violation of the University's Student Honor Code and an act of academic dishonesty. UT is aware of the sites used for sharing materials, and any materials found online that are associated with you, or any suspected unauthorized sharing of materials, will be reported to Student Conduct and Academic Integrity in the Office of the Dean of Students. These reports can result in sanctions, including failure in the course.
10. **Academic Integrity and the University Code of Conduct:** Students are expected to maintain absolute integrity and a high standard of individual honor in scholastic work undertaken at the University of Texas at Austin. Academic dishonesty includes cheating, [plagiarism](#), unauthorized collaboration, falsifying academic records, misrepresenting facts, multiple submissions, and any other acts or attempted acts that violate the basic standard of academic integrity. Consequences of academic dishonesty can be severe. Grade-related penalties are routinely assessed but students can also be suspended or even permanently expelled from the University for scholastic dishonesty. Other potential consequences can be particularly far-reaching, such as the creation of a disciplinary record that may very well impact future opportunities. Furthermore, incidents of scholastic dishonesty diminish the overall value of scholastic achievements on this campus and reflect poorly on the University.

Selected Material from Lectures/Assignments

The repository below will be updated throughout the semester with important class materials (e.g., a description of some of the pre-requisite materials you need to know; video recordings of zoom lectures; pdf versions of powerpoint presentations made during the lecture; scans of materials that would usually be handwritten on the blackboard or document camera; howeworks and other assignments). However, I strongly recommend that you do not only rely on this posted material and do your best to attend class in synchronous mode (i.e., at the time it is offered) so that you can benefit from in-class discussions or activities and get the most out of this course.

- [Updated Course Syllabus as of Aug. 29/2021](#)

Extra Class Resources

Research Opportunities, Research Talks, Careers, Courses

- [The Freshman Research Initiative \(FRI\) website](#)
- [Research Opportunities for Undergraduates in the Astronomy Department](#)
- [Research and Career Opportunities for Undergraduates](#)
- [EUREKA: Research/Career Opportunities across the College of Natural Science for Undergraduates.](#)
- [CNS Undergraduate Research Forum](#): Present a poster or/and a short oral presentation on your ongoing research project at the CNS Undergraduate Research Forum held every Spring on the UT campus.
- [Calendar of Weekly Colloquia and Research Seminars \(Undergrads welcome!\)](#)
- [The UT Career Design Center](#)
- [Astronomy Courses](#)
- [UT Academic Calendar](#)

Journal Articles and Popular Articles

- NASA ADS Abstract Services:
 - [Public Link for Classic NASA/ADS form](#) (This allows you to find papers and access abstracts, but you may not be able to download the full papers from journals that require subscriptions)
 - [UT library subscription eproxy link for Classic NASA/ADS form](#) (This allows you to find papers, access abstracts, and download full paper from journals for which UT has a subscription.)

 - [Astrophysics Preprint server](#)

 - [CNN Space](#)

 - [NY Times Science](#)

 - [BBC Science](#)

 - [Sky and Telescope](#)
-