AST 301 INTRODUCTION TO ASTRONOMY-WB

Unique number: 48030

Spring 2021

Class time: MWF 2:00-3:00 PM - On-line

Instructor: Judit Györgyey Ries
Pronouns: She, her, hers
Email: Use Canvas only to contact all of us

Times to chat with your instructor (Through Zoom):
M 3:00 - 4:30 pm, W 12:00 - 1:30 pm or anytime as long as you make an appointment ahead of time

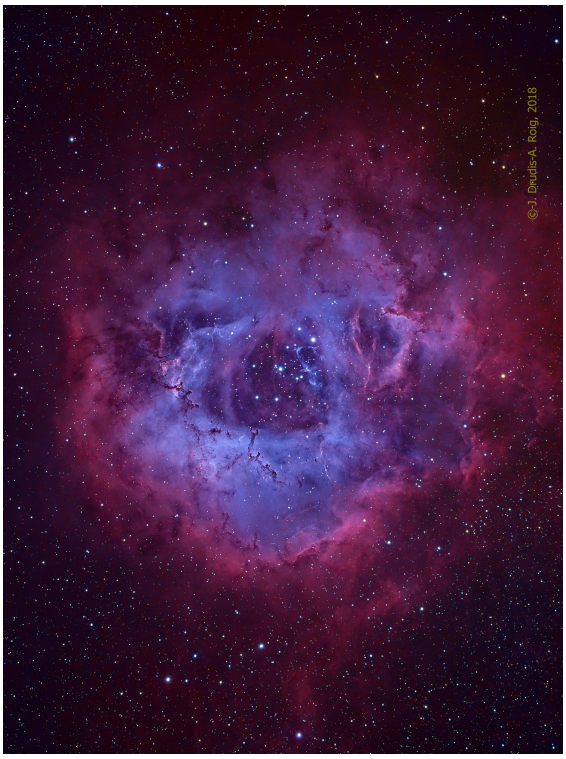
Teaching Assistants:

Ajit Gopalakhrishnan - Chat time Thursday 1:00 - 2:00 pm Meet Ajit

Nandhini Kumar - Chat time Tuesday 11:00am - 12:00 Meet Nandhini

Akshi Tomar - Chat time Friday 10 - 11 am Meet Akshi

Course Description:



The Trifid nebula

This course will provide a general overview of astronomy for non-science majors, including relevant physic concepts, the nature of planets, stars, galaxies, and the universe as a whole. You will get a taste of how science works; and develop critical thinking skills while you gain insight into how the Universe works.

This course carries the Quantitative Reasoning flag. Quantitative Reasoning courses are designed to equip you with skills that are necessary for understanding the types of quantitative arguments you will regularly encounter in your adult and professional life. You should therefore expect a substantial portion of your grade to come from your use of quantitative skills to analyze real-world problems.

What will you learn? - Course outcomes

By the end of the course

You will discover that science is not a straightforward, one step process

- Identify the steps of the scientific method, and explain the role of each step
- Illustrate how did the process work on the laws you learned in class

You will be able to illustrate the role Astronomy plays in our everyday life

- Explain how the natural cycles observed on the sky lead to our modern timekeeping
- Describe how the observation of the planets, and prediction of planetary motion lead to the use of artificial satellites

You will develop the ability to do quantitative reasoning from the fundamental laws explained in class, such as

- Interpret equations to predict what happens to the outcome if one or more variables are changed

You will develop a basic familiarity with the night sky

- Find some well know constellation and find North on the Northern hemisphere
- Explain how we constructed our coordinate systems on the sky

You will be able to describe the hierarchy of the objects in the Universe, and the scale of the sizes and distances in actual sizes and proportions

- Compare and contrast the sizes of the planets in our solar system to the distances between the planets
- Have an order of magnitude recollection for the sizes of planets, stars and galaxies

How will you learn?

We will focus on conceptual understanding, rather than memorization of facts. I will illustrate the physical laws by going through examples; and check your knowledge through Instapoll questions in class. You will work on tutorials in groups, discussing and solving problems through teamwork. The quizzes and homeworks are also designed to reinforce the concepts. The Moon Journal is a simple project for you to learn good observing practices, and draw simple conclusion based on your observations.

Course requirements

There is no prerequisite for this course. Bring an inquisitive approach and reflective attitude to what you will learn will allow you to reap maximum benefits.

I will review the physics principles necessary, and how to use the simple formulas to describe them. We will practice these in class. Participation is group work in class and Canvas discussions, as interactive learning activities will be an important part of this course. I will post the worksheets before class. You will be working in small groups of 4 to 6 people, discussing questions posed during the class.

Textbook

We are using a free on-line textbook, “**Astronomy**” by Fraknoi, Morrison and Wolff available at:

openstax.org/details/books/astronomy/

You can use it online, and download it for free, although contributions to maintain the site are welcome. It contains a lot of material, but you will be responsible only for the subjects covered on the lecture slides. You can use it as a reference book when studying for exams.

Classroom expectations

Your preparation for discussion and participation is extremely important for you and your team. Here are some ground rules:

- Even though we have the course on-line, respect for others is vital. You can expect that as the instructor, I am concerned about the educational experience of each student in the class, respectful of individual differences, encouraging of creativity, reasonably open and accessible to discuss material and assignments, thorough in evaluating assignments, and rigorous yet supportive in maintaining high standards for performance.
- As a student, you are expected to work individually and with others, to create an atmosphere that is safe, valuing of one another, and open to diverse perspectives. Everyone is expected to show courtesy, civility, and respect for one another. Comments or postings that degrade or ridicule another, whether based on individual or cultural differences, are unacceptable.
- Participation/Engagement. Thinking is not a spectator sport. This course requires active participation, which is crucial to your success in developing critical thinking. The more you put into it, the more you will get out of it. Active participation includes being prepared to discuss readings, assignments, and concepts, engaging yourself in classroom activities and discussion, and putting your best effort in both formal and informal assignments.
- Have fun! This course your adventure into scientific thinking, in order to empower yourself with the ability to evaluate information, and reasoning through arguments that you encounter.

Personal Pronouns

Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with differences of race, culture, religion, politics, sexual orientation, gender, gender variance, and nationalities. Class rosters are provided to the instructor with the student's legal name, unless they have added a "preferred name" with the Gender and Sexuality Center

http://diversity.utexas.edu/genderandsexuality/publications-and-resources/

I will gladly honor your request to address you by a name that is different from what appears on the official roster, and by the gender pronouns you use (she/he/they/ze, etc). Please advise me of any changes early in the semester so that I may make appropriate updates to my records. For instructions on how to add your pronouns to Canvas, visit

https://utexas.instructure.com/courses/633028/pages/profile-pronouns.

Class Communication

All class communication will be conducted strictly through Canvas at canvas.utexas.edu, including anouncments and emails. Your student e-ID will give you access to the site. I will send announcements, and post assignments on it. You will also be submitting the quizzes, homeworks, and a Moon Journal through Canvas.

Lectures will be conducted through regularly scheduled zoom session during the scheduled class period. When you log onto the class website, you should see a link called "Zoom", right under Syllabus. It is integrated into Canvas, so if you do not yet have it, you can click on the link and it will bring up a window asking you to either join online, or download the app. It should work on all platforms, although computer screens and tablets will give you better visibility than your phone.

Your success in this class is important to me. We will all need accommodations because we all learn differently. If there are aspects of this course that prevent you from learning or exclude you, please let me know as soon as possible. Together we'll develop strategies to meet both your needs and the requirements of the course. I also encourage you to reach out to the student resources available through UT. They are listed on this syllabus after the University policies.

Attendance and participation:

I strongly encourage you, to join the class, as I will use Instapoll for quick in class questions, and your participation is part of your grade. We will also work on tutorials in class. You can find the Instapoll link in the menu on the left of the page. You will not be penalized if you miss up to five lectures without providing any explanation; unexpected obligations can come up. If you have to go to the doctor, make sure you get a note informing me how long you cannot attend class. (You might not need to show it to me, but hang on to it, just in case). You can find the recorded lectures online; will be available shortly after class in addition to the lecture slides.

- We will be using the Canvas Instapoll tool for in-class polling and attendance. You can miss a portion of these points without penalty. For example, if you earn 80 points or more of the maximum available Instapoll points throughout the semester you will get 100% for this portion of your participation grade. If you earn 70-60 points, you'll receive a 90% for this portion of the course grade; if you earn 60-50 points from polling, you will receive 80% for participation, etc. For some questions testing your understanding of a hard concept you will receive credit even if it your answer is not correct, giving you attendance point, and helps me to gauge your comprehension. In case you cannot attend the lecture synchronously you can still receive credit for up to five occasions, if you submit your answer in email to me upto midnight the day after the class.
- We will work on tutorials in groups during some classes. I will upload the worksheets to the class website the assignment in .pdf format. I recommend that you print it out, it is easier to work on paper while you are on zoom. We will likely not finish the tutorials in class; you need to submit the finished version through Canvas within a day.

Assignments

All assignments need to be submitted online either as multiple choice or short answers as pdf file to upload. Please convert all image files into a single pdf https://combinepdf.com/, or https://www.ilovepdf.com/ on the web.

Homework: *There will be six homework assignments, submitted through Canvas. I encourage you to discuss the homework with your classmates in an online group, and work on it together. However, your completed assignment should be in your own words, and handwritten. Just because you missed the original deadline, do not give up on the homework. You will still receive credit if you submit it up to 2 days past the deadline, though you will lose 12.5% for each day that you are late. Duplicate works will not receive credit.*

Exams: *There will be six, on-line exams, but no comprehensive final. You have to take all six in class exams; no exceptions will be granted. However, I will drop the worst of the scores as long as you make at least a D- on the sixth exam. Make up exams will be given only under exceptional circumstances. All exams will be closed book. Before each test there will be a review session to help you with the preparation. I recommend that you send your questions to us ahead of the session, so we can focus on what you really need. The review session is not redoing the lectures, you have the recording if that is what you need.*

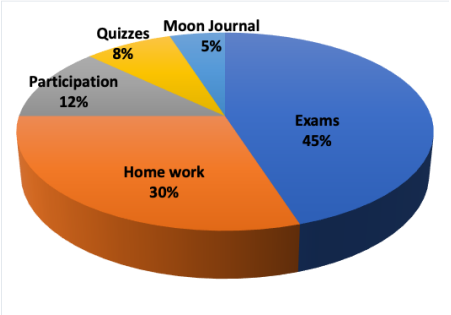
Quizzes: *These will give you a low-pressure way to check your understanding of the material. You need to complete the quiz on the syllabus to unlock the modules.*

Moon Journal: *Observations are very important part of science. All you need to do is to go outside find the Moon for at least 9 clear occasions spread over about 30 days. Write down the date and the time of your observations. Give the location of the moon by measuring its altitude, and its angle from North. Draw the phase as accurately as you can, and label (waxing/ waning, etc.) for each drawing. Make sure you keep your original observations, and submit a legible, clean write up. Taking a picture with your iPhone could be helpful, though you I still want you to draw the phase by hand. I will provide a template you could use, scan and upload it. (You can use a phone app or the above links to create the document if you do not have a scanner.)*

Extra credit assignment: *Participate in one McDonald Observatory Virtual Star party and write a short summary of what you have seen; and tell me, what is the most interesting thing you learned watching it.*

Grades

You can earn 100 points in this course. The grades will be based on participation in discussion and tutorials (12 points), quizzes (8 points), homeworks (30 points), on-line exams (45 points), and Moon Journal (5 points). Completion of the extra credit assignment adds 2 extra points to your calculated score.



Grading policy

Final grades will be determined on the basis of the following rubric. Please note: to ensure fairness, all numbers are absolute, and will not be rounded up or down at any stage. Thus, a B will be inclusive of all scores of 81.000 through 84.999. The University does not recognize the grade of A+.

< 55	55-58	58-60	60-64	64-67	67-70	70-77	77-81	81-85	85-88	88-92	> 92
F	D-	D	D+	C-	C	C+	B-	B	B+	A-	A

Tentative Course Schedule

Changes to the schedule may be made at my discretion and if circumstances require. It is your responsibility to note these changes when announced (although I will do my best to ensure that you receive the changes with as much advanced notice as possible).

Week	**Date**	**Subject**	**Book chapter***
	20-Jan	Introduction: Getting acquainted	
1	22-Jan	Overview of the universe	Chapter 1
	25-Jan	Navigating the sky, Daily motion	Chapter 2
	27-Jan	Yearly motion, Seasons	Chapter 4

2	29-Jan	Sky Tutorials/Lunar phases	Chapter 4
	1-Feb	Phases/Eclipses	Chapter 4
	3-Feb	Ancient Astronomy to Copernicus	Chapter 2
3	5-Feb	Galileo, Brahe and Kepler	Chapter 2
	8-Feb	**Exam 1**	**On Modules 1&2**
	10-Feb	Electromagnetic Spectrum/Waves	Chapter 5
4	12-Feb	Spectrum/composition and motion	Chapter 5
	15-Feb	Astronomical instruments	Chapter 6
	17-Feb	Tutorials	Chapter 5
5	**19-Feb**	**Exam 2**	**On Module 3**
	22-Feb	Newton's laws and gravity	Chapter 7
	24-Feb	Newton's laws and gravity - Tutorial	Chapter 8
6	26-Feb	Solar System overview	Chapter 8
	1-Mar	Earth in detail /Altering our planet	Chapter 8
	3-Mar	Tides and the Moon	Chapter 4, 8
7	5-Mar	Mercury, Venus, Mars	Chapter 9,11
	8-Mar	**Exam 3**	**On Modules 4&5**
	10-Mar	Giant planets II	Chapter 11
8	12-Mar	Satellites and ring systems	Chapter 12
	15-Mar	**SPRING BREAK**	
	17-Mar	**SPRING BREAK**	
9	**19-Mar**	**SPRING BREAK**	
	22-Mar	Small bodies, Dwarf planets	Chapter 13
	24-Mar	Solar System formation	Chapter 14
10	26-Mar	Search for other planets	Chapter 21
	29-Mar	**Exam 4**	**On Modules 6&7**
	31-Mar	The Sun as a star	Chapter 15, 16
11	2-Apr	The Sun's energy production and structure	Chapter 15, 16
	5-Apr	Measuring stellar properties	Chapter 17, 19
	7-Apr	Organizing the stars	Chapter 18, 19
12	9-Apr	Tutorial/Interstellar matter	Chapter 20
	12-Apr	**Exam 5**	**On Modules 8&9**
	14-Apr	Basics of Stellar evolution	Chapter 21
13	16-Apr	Low and medium mass stars	Chapter 22
	19-Apr	High mass stars	Chapter 23
	21-Apr	Black holes etc.	Chapter 24
14	23-Apr	Our galaxy	Chapter 25
	26-Apr	Other galaxies	Chapter 26
	28-Apr	Active galaxies	Chapter 27
15	30-Apr	The big picture	Chapter 28

	3-May	The birth of the Universe	Chapter 29
	5-May	What's next?	
16	7-May	**Exam 6**	**On Modules 10&11**

*The appropriate book sections will be posted in the modules.

Scheduled Review Sessions will be conducted through Zoom before the exam.

Academic Dishonesty

Please put your cell phones to airplane mode before you enter the classroom, unless you have a legitimate reason to expect a phone call. Then set it on “vibrate”, answering it only in case of an emergency. Also, as consideration for your fellow students stay till the end of the class early unless you have talked to me in advance about leaving.

The core values of The University of Texas at Austin are learning, discovery, freedom, leadership, individual opportunity, and responsibility. Each member of the university is expected to uphold these values through integrity, honesty, trust, fairness, and respect toward peers and community. Students who violate University rules on scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and/or dismissal from the University. Standards for Academic Integrity are posted at

https://deanofstudents.utexas.edu/conduct/standardsofconduct.php

The penalty for cheating on an exam is serious; you will get a total score of zero.

Plagiarism: As a research university, the University of Texas at Austin takes plagiarism very seriously. The consequences of getting involved in a plagiarism infraction are simply not worth it. Always cite your sources, and when in doubt consult a professor or librarian. You may also read more about plagiarism at the Student Judicial Services website:

https://deanofstudents.utexas.edu/conduct/academicintegrity.php

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 my 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. I am well 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.

Class Recordings:

Class recordings are reserved only for students in this class for educational purposes and are protected under FERPA. The recordings should not be shared outside the class in any form. Violation of this restriction by a student could lead to Student Misconduct proceedings.

Documented Disability Statement: Please notify me of any modification/adaptation you may require accommodating a disability related need. The University of Texas at Austin provides upon request appropriate academic accommodations for qualified students with disabilities. For more information, contact Services for Students with Disabilities at 471-6259 (voice) or 232-2937 (video phone) or

http://www.utexas.edu/diversity/ddce/ssd

Religious Holidays: By UT Austin policy, you must notify the professor of a pending absence at least 14 days prior to the date of observance of a religious holy day. If you must miss a class, an examination, a work assignment, or a project in order to observe a religious holy day, you will be given an opportunity to complete the missed work within a reasonable time after the absence.

A climate conducive to learning and creating knowledge is the right of every person in our community. Bias, harassment, and discrimination of any sort have no place here. If you notice an incident that causes concern, please contact the Professor, TA, and the Campus Climate Response Team.

http://diversity.utexas.edu/ccrt

Title IX Reporting

Title IX is a federal law that protects against sex and gender-based discrimination, sexual harassment, sexual assault, unprofessional or inappropriate conduct of a sexual nature, dating/domestic violence and stalking at federally funded educational institutions. UT Austin is committed to fostering a learning and working environment free from discrimination in all its forms. When unprofessional or inappropriate conduct of a sexual nature occurs in ourcommunity, the university can:

1. Intervene to prevent harmful behavior from continuing or escalating.

2. Provide support and remedies to students and employees who have experienced harm or have become involved in a Title IX investigation.

3. Investigate and discipline violations of the university's relevant policies.

Department of Astronomy Ground Rules

The Department of Astronomy has ground rules for all of its undergraduate courses. They are described in the document "Memo to Undergraduate Astronomy Students Regarding Astronomy Courses," which is available online at

https://astronomy.utexas.edu/academics/undergraduate-program/memo-to-undergraduate-astronomy-student

Email through Canvas is recognized as an official mode of university correspondence; therefore you are responsible for reading your email for university and course-related information and announcements. Please check your email regularly and frequently.

Counseling and Mental Health Center

The Counseling and Mental Health Center serves UT's diverse campus community by providing high quality, innovative and culturally informed mental health programs and services that enhance and support students' wellbeing, academic and life goals. To learn more about your counseling and mental health options, call CMHC at (512) 471-3515.

If you are experiencing a mental health crisis, call the CMHC Crisis Line 24/7 at (512) 471-2255.

The Sanger Learning Center

Did you know that more than one-third of UT undergraduate students use the Sanger Learning Center each year to improve their academic performance? All students are welcome to take advantage of Sanger Center's classes and workshops, private learning specialist appointments, peer academic coaching, and tutoring for more than 70 courses in 15 different subject areas. For more information, please visit http://www.utexas.edu/ugs/slc or call 512-471-3614 (JES A332).