

PHY-102

Astronomy, Cosmology, and Astrophysics

Lecture
MWF
9 - 9:50 am
Olin 103

Lab
Tues/Thur
9- 9:50 am
Olin 217

Observatory
Sun-Thur
7-9 pm OR 8-10 pm
(daylight/weather)
Olin 4th Floor

Course Description and Objectives

How did our Universe arise? Students will learn more than just the quantitative data, but also how our understanding of the science of space has developed. We ask questions like, "What were the cultural and political atmospheres that led to how and why we have the understanding of the universe that exists today?"

Designed for non-science students, this course covers two basic and related topics. The first acquaints the student with the methods of observational astronomy and the use of small astronomical telescopes. The second

topic is concerned with the astrophysical evidence which forms the basis of cosmological theories of the nature and origin of the solar system, galaxies, and the universe. Included are discussions of habitable extrasolar planets, pulsars, space travel, general relativity, and the fate of the Universe.

Student Learning Outcomes

By the end of this class, students will be able to:

- Analyze enduring and contemporary questions or challenges from multiple disciplines, using qualitative and quantitative methods. **NTSCI**

- Use ethical, religious, or philosophical frameworks to evaluate their own and/or others' responses to this enduring or contemporary question or challenge. **NTSCI**

- Examine issues of cultural difference both locally and globally. **NTSCI**

- Communicate effectively in written, spoken, and creative expression with a variety of audiences. **NTSCI**

What is in this syllabus?

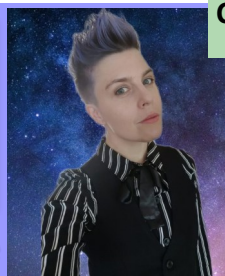
Course Requirements	2-4
Grading	2
Help & Resources	3-4
Course Policy	5
Calendar	6

Dr. Darsa Donelan

Email: ddonelan@gustavus.edu

Office: Olin Hall 204

Office Hours: 5-7 pm Center for Inclusive Excellence

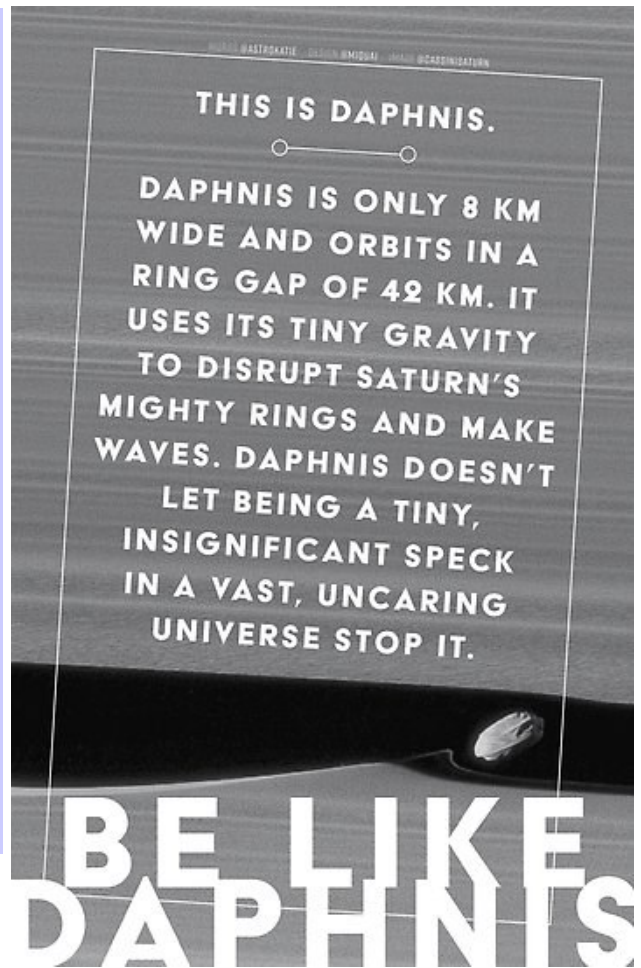


Open Door Policy:

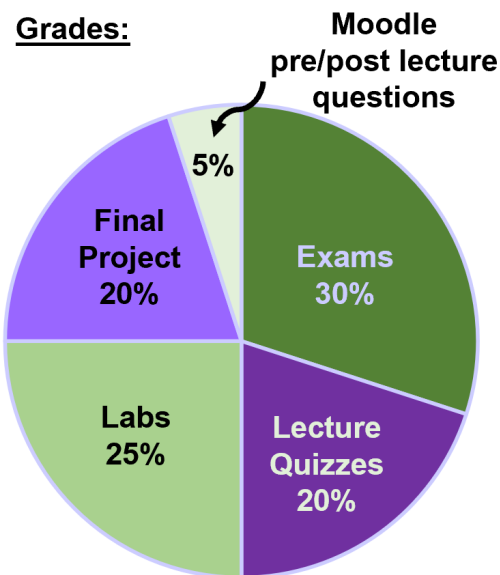
Stop by my office at any time for discussion on course work or just to have a cup of tea and friendly conversation.

Requesting Accommodations

Gustavus Adolphus College is committed to ensuring equitable and inclusive learning environments for all students. If you have a disability and anticipate or experience barriers to equal access, please speak with the accessibility resources staff about your needs. A disability may include mental health, attentional, learning, chronic health, sensory, physical, and/or short-term conditions. Accessibility resources staff are located in the Academic Support Center (<https://gustavus.edu/asc/accessibility/>) (x7227). Accessibility Resources Coordinator, Corrie Odland (codland@gustavus.edu), can provide further information.



Grades:



94 – 100	A
90 – 94	A-
86 – 90	B+
82 – 86	B
78 – 82	B-
74 – 78	C+
70 – 74	C
66 – 70	C-
62 – 66	D+
58 – 62	D
0 - 58	F

Course Requirements

Lecture Attendance and Activities

The weekly class sessions are a main source of learning for the course. Please arrive to class on time and plan to stay for the entire session. There will be various lecture activities throughout the semester that are designed to give you an opportunity to apply the concepts we have been learning in class.

Laptop policy: All course documents will be posted on the course Moodle site, many of them contain images along with text. Please come to class prepared to take notes. You may use a laptop/tablet in class, but only to take notes or access class material. Do not use your laptop for gaming, visiting social media, etc. Remember, many individuals are distracted by glowing screens in their line of vision. I may ask that all devices be put away during some class sessions, so please come to class prepared with a pen and paper.

Remote Learning: If you are unable to attend class in person, please join through Zoom. A link will be provided via Moodle and Google calendar. Additionally, all lectures will be recorded and posted to YouTube for an asynchronous learning option.

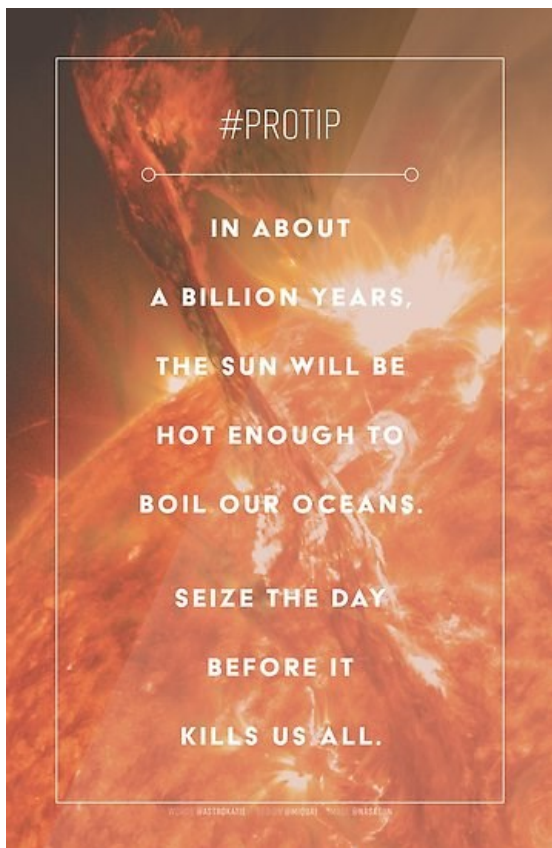
Course Requirements, cont.

Lecture Quizzes (20% of grade)

There will be lecture quizzes posted on Moodle after each lecture to assess your understanding of the concepts covered that day. Lecture quizzes will be **due a week after they are assigned**. **Corrections will be allowed via office hours** up to 2 weeks after quiz is posted.

Moodle Pre/Post Lecture Questions (5%)

You should plan to complete assigned pre/post-lecture questions by **9AM before the class** session on which they are listed. Each set of questions will be posted as a Moodle quiz and contain educational videos and/or readings on which the questions will be based. Your answers to these questions will help me update the content of my lectures as needed. Questions are **graded on completion** rather than accuracy. There will be approximately 2-3 of these questions each week. **50% of these questions must be answered during the semester for full credit.**



Help & Resources

1. Multilingual Student Support

You can find support through the Center for International and Cultural Education's (<https://gustavus.edu/cice/>) Multilingual and Intercultural Program Coordinator (MIPC), Pamela Pearson (ppearson@gustavus.edu). Pamela can meet individually for tutoring in writing, consulting about specific assignments, and helping students connect with the College's support systems.

2. Mental Wellbeing

If you or someone you know expresses mental health concerns or experiences a stressful event that can create barriers to learning, Gustavus services are available to assist you, and include online options. You can learn more about the broad range of confidential health services available on campus at <https://gustavus.edu/counseling/> and <https://gustavus.edu/deanofstudents/services/>.

Labs (25%)

Table top Labs: Attendance at lab experiments is required. Generally, the lab period will be enough for students to take necessary data, but additional work time may be needed outside of lab to finish the lab worksheet. **Worksheets will be due 1 week after each lab.**

Observing Labs: Each student will be required to complete **3 evening observing laboratory exercises** (1 due every 4 weeks). Students must sign up on the Google sign-up sheet by the time the laboratory opens. If you are not signed up, you may be turned away by the observing TA if they are at capacity.

To accommodate those who may not be able to do in-person observing, we will also livestream a camera hooked up to our telescope as we are able to.

Observing labs are worth **2x** as much as table top labs.

Help & Resources, cont.

3. Research Assistance

Students can always get help with research at the library. Reference librarians will help find information on a topic, develop search strategies for papers and projects, search library catalogs and databases, and provide assistance at every step. Drop-ins and appointments are both welcome. Visit https://gustavus.edu/library/reference_question.php for hours, location, and more information.

4. Title IX: Sexual Misconduct Prevention and Resources

Gustavus Adolphus College recognizes the dignity of all individuals and promotes respect for all people. As such, we are committed to providing an environment free of all forms of discrimination including sexual and gender-based discrimination, harassment, and violence like sexual assault, domestic violence, dating violence, and stalking. If you (or someone you know) has experienced or is experiencing these types of behaviors, know that you are not alone. Resources and support are available; you can learn more online at <https://gustavus.edu/titleix/>.

Course Requirements, cont.

Exams (30%)

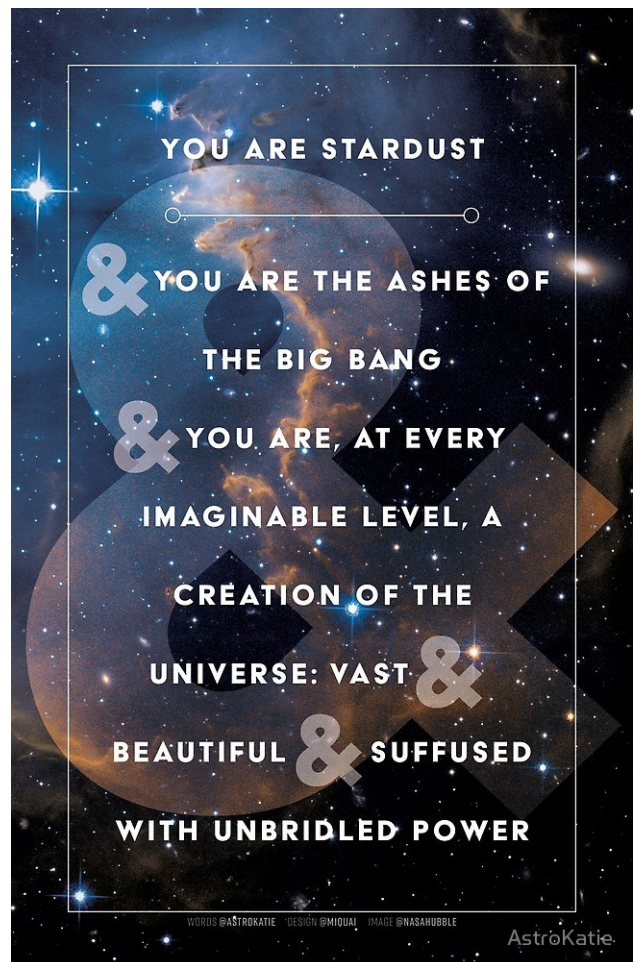
There will be **six 1-hr exams** every 2-3 weeks. These exams are designed to reinforce the concepts from the lecture tutorial quizzes (with many similar questions). These exams will be **posted/completed on Moodle**. The exams will open on designated Fridays after class and close the following Sunday at 11:59 pm. However, **these exams will be timed** and your answers will be submitted 1-hr after you start it. Exams must be done on your own. **You can use your class notes and lecture tutorials.**

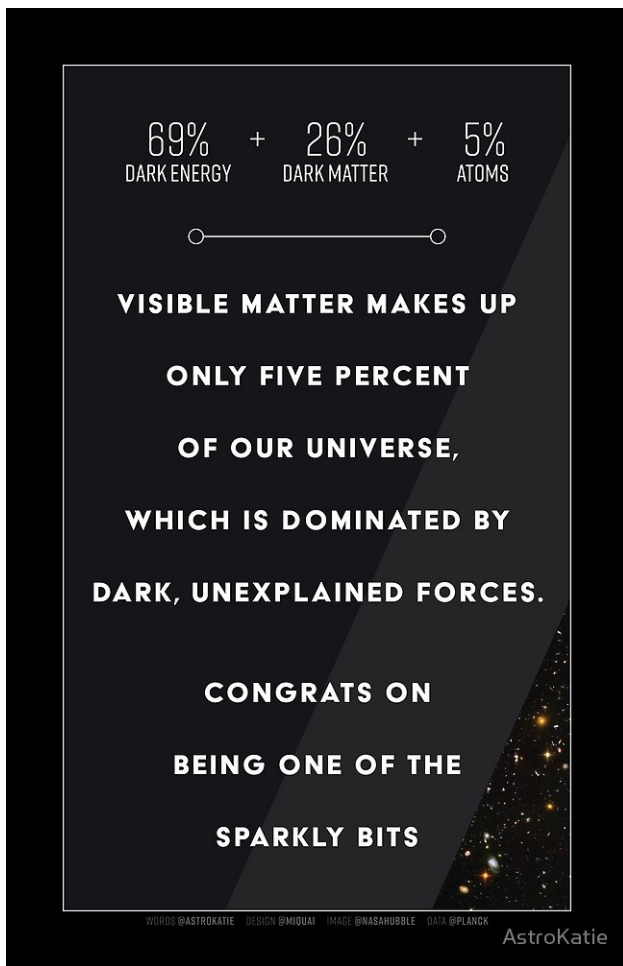
Final Project (20%)

For your course project, you will **relate topics of astronomy to your own major/minor** (or prospective major/minor). You can compose a 10 minute presentation, 1000-word essay, painting, music, one act play, financial analysis, computer simulation, etc. that presents your on your chosen topic, supports it with relevant evidence, and communicates it to a general audience. If you create a work of art, an artist statement will be required.

This project will be graded on **accuracy** of science, **clarity** of science for your peers, and **connection** to your major/minor. A grading rubric will be posted on Moodle.

Group projects will require my approval.





Take responsibility of YOUR education by completing your own work & participating in class.

Course Policy

Academic Integrity

Learning in this class depends on you completing all individual assignments yourself and all required group assignments with your group.

Violations of academic integrity cheating, plagiarism, etc. will result in no credit for the assignment, course failure, and/or referral for disciplinary action. Using content generated by an artificial intelligence third-party service or site (AI-generated content) without proper attribution or authorization would also be a form of plagiarism.

For more information, please review Gustavus's policy on academic integrity (https://gustavus.edu/general_catalog/current/acainfo).

Come to class on time and with materials ready to participate.



Be respectful to your classmates, teaching assistants, and professor.



- We are going to prioritize supporting each other as human.
- We are going to prioritize solutions that make sense for the most.
- We are going to prioritize sharing resources and communicating clearly.
- Everybody needs support and understanding.

Communication

If you have any general questions about the course that are not answered in this syllabus, please post a message under the #Q&A-for-Darsa channel in the course Discord. To discuss any individual issues with me, it is best to visit office hours to speak to me in person. You can also direct message me over Discord or by email.

Website

The course website can be found through Moodle (<https://moodle.gac.edu/>). The website includes access to course documents and links to course Discord forum and the course blog site.

	Location	Time
Lecture	In-Person: Olin 103	MWF 9 – 9:50 am
	<u>Online Zoom</u> [Links to meeting room on Moodle]	
Lab	In-Person: Olin 217	TR 9 – 9:50 am (attend registered section)
Observatory	In-person – 4th floor Olin Online – Remote imaging (must be requested in advance)	Selected evenings: Usually Sun-Thurs 7-9 pm or 8-10 pm (daylight and weather permitting)
FREE!!! Help Sessions w/ Darsa	Center for Inclusive Excellence Zoom (must request in advance)	5-7 pm
Tutoring	Olin 216	Sun-Thurs 7-10 pm
Class Forum	Discord [Link on Moodle]	Available 24/7

Assessment	Where to find	Due
Lecture Tutorial Quizzes	Assignment: Moodle	1 week after assigned
	Corrections: Office Hours	2 weeks after assigned
Labs	Lab Manual: Moodle	Tabletop - 1 week after assigned Observing – 1 every 4 weeks
Pre/post lecture questions (Credit for completion)	Moodle	9 AM before lecture
Six 1-hr exams (5% each)	Moodle (Timed exams!)	Every 2-3 weeks (open Friday after class and close Sunday night at 11:59 pm)
Final Project	Rubric on Moodle Upload to Moodle	Last week of classes