

Stars, Galaxies, and the Cosmos

ASTRON 0089, Summer 2020

Instructor: Dr. David Nero
Office: ~~221B Allen Hall~~ My basement
Office Hours: By appointment on Zoom

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Meeting Times: Monday and Wednesday, 9:30am–12:10pm on Zoom
Recitation is immediately following class.

Class Website: Canvas (canvas.pitt.edu)

Textbook: *OpenStax Astronomy* (free in digital form)

Course Description

This is a self-contained course for students not majoring in the physical sciences. The Universe in which we live is an unimaginably vast and rich place that is understandable through the same physical laws that govern our existence here on Earth. By exploring topics from our nearest neighboring stars and their alien worlds to the farthest galaxies newly formed after the Big Bang, this course will engage your mind to better understand our Universe and your everyday world. Through active and engaged participatory lectures, we will observe the cosmos and learn about the birth, life, and death of stars and their mysterious remnants: pulsars and black holes. From studying stars and our own Milky Way Galaxy, we will expand our vision to cosmology and investigate the origin and ultimate fate of the Universe.

Course Learning Objectives

- Describe the relative sizes of planets, stars, galaxies, and the observable universe
- Relate the motions of the earth, moon, and sun to seasons, moon phases, eclipses, and the apparent motion of the stars
- Explain the properties of light and how telescopes are used to observe the sky
- Characterize the workings of the sun and our solar system
- Describe the techniques used to study distant stars and compare them to the sun
- Explain how stars are born and how they die, in some cases creating black holes
- Describe our galaxy, the Milky Way, and how it has shaped our own solar system
- Characterize the different types of galaxy and how they can change throughout time
- Explore the mysteries of dark matter and the expansion of the universe
- Investigate how the universe began and how it may end

Policies

Attendance Policy: We will meet for each class period on Zoom. Attendance will be recorded, but not graded. Be aware that low attendance has been shown to be strongly correlated with low grades.

Late Assignments: Assignments will be assessed a penalty of 20% per day late. Exceptions or alternate arrangements will be made for cases of emergency, as long as you let me know promptly.

Academic Integrity: All students are expected to adhere to the standards of academic honesty. Any student engaged in cheating, plagiarism, or other acts of academic dishonesty will be subject to disciplinary action. Any student suspected of violating this obligation for any reason during the semester will be subject to the process outlined in the University Guidelines on Academic Integrity (<http://www.as.pitt.edu/fac/policies/academic-integrity>).

Disability Services: If you have a disability that requires special accommodations, you need to notify both the instructor and Disability Resources and Services no later than the second week of the term. You may be asked to provide documentation of your disability to determine the appropriateness of accommodations. To notify Disability Resources and Services, call (412) 648-7890 (Voice or TTD) to schedule an appointment. The Disability Resources and Services office is located in 140 William Pitt Union on the Oakland campus.

Statement on Classroom Recording: Lectures will be recorded and posted on Canvas. These recordings may not be distributed to anyone not directly involved in this course. In addition, students may not create their own recordings of classroom lectures, discussion and/or activities without the advance written permission of the instructor, and any such recording properly approved in advance can be used solely for the student's own private use.

Title IX:

“No person in the United States shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving Federal financial assistance.”

As a professor I am a mandatory reporter, and I am required to report violations of Title IX that I observe or am made aware of to the Title IX office (<https://www.titleix.pitt.edu/>). Title IX violations include, but are not limited to, sexual harassment, sexual violence and verbal or sexual abuse. Within the classroom, behavior in violation might appear as: suggestive jokes or innuendos, inappropriate touching, and unwanted sexual behavior or advances, but my capacity and obligation to report does not end at the classroom.

Grade Scale

If you achieve the following final grade percentages in the course, you will receive at least:

Percentage	Minimum Grade
90%	A-
80%	B-
70%	C-
60%	D-

I do not anticipate the need to curve grades, but if I do, it would only be upwards. You are not competing with one another, and it is possible for everyone to get an A (as long as you make the effort to do A-level work)!

Grading

There are no exams, quizzes, or other high-stress assignments. Instead, you will complete a total of 10 homework assignments (effectively one per lecture) ranging from 20 to 40 points each. These assignments will test the learning objectives of the course in a variety of ways:

1. Short answer questions
2. Questions about real world (observing) or online (simulation) activities
3. Essay questions
4. Relating a recent news article to what you've learned in class

To earn top marks, you must use these assignments to demonstrate that you understand the course material well enough to make connections between the different topics we cover. After all, anybody can look up a fact on Wikipedia.

You will turn in the previous assignment at the start of each recitation. Your TA will answer any lingering questions arising from the assignment, and then you will use the remaining time to start the next assignment with your TA's help. Details about formatting and citations will be discussed at your first recitation. Your final course grade will be calculated as points earned divided by total possible points.