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# Overview

## ASTR 204 (Great Debates in Astronomy), Spring 2019

TTh 12:30-1:45 PM, Flandrau Planetarium Mezzanine

Prof. Ann Zabludoff (Instructor), Ms. Carolyn Raithe (Teaching Assistant)

### Office Hours:

- Raithe: Steward Observatory's Parker Library, 1-2 pm Wed, (520) 621-6029 (phone)
- Zabludoff: Main Steward Observatory Building, Rm 207, 11 am-noon Fri or by appointment, (520) 626-2509 (phone)

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*This course satisfies the Natural Sciences Tier 2 requirement and is intended for non-science majors. We will take an in-depth look at some of the questions that stumped astronomers of the past and that puzzle astronomers today. The four questions for*

*this semester are: 1) How did the dinosaurs die? 2) What is the origin of the Moon? 3) What is dark matter? and 4) Are we alone in the Universe? We will study the highlights of work that sheds light on these questions, learn about the scientific personalities behind the discoveries, and debate the issues in class. We will review the physical principles necessary to understand why these questions are important, how astronomers have learned what they know, and what issues remain uncertain. There will be a total of four in-class debates conducted by the students and moderated by the instructor. One debate will end each of the four units of the course. Each student will develop a creative project related to one of the course themes or to a raging controversy in modern astronomy. The emphasis of the course is on understanding, not on memorization.*

## Background

**Recommended Prerequisite: ASTR170B1**

The concepts of the electromagnetic spectrum (light at all wavelengths), the solar system, stars, and galaxies are fundamental to understanding the information presented in this course. If you have not been exposed to these concepts before, you should study them now in a general astronomy book like that used for ASTR170B1 (The Physical Universe). You should also be familiar with basic algebra, trigonometry, fractions, and scientific notation.

This course will also require frequent reading and discussion of popular science articles, as well as independent research. A strong interest in the course material is the best prerequisite! You should have a small inexpensive calculator at your disposal (one that does powers, roots, and trigonometric functions). Please seek help when you encounter a concept that you do not understand.

## Evaluation

Your grade in this course will depend on your participation in class and in your debate (20%), as well as your performance on the homework exercises (15% in total),

midterm exam (15%), the final exam (30%), and the creative project (20%). Both exams are closed-note and will consist of multiple-choice and short written answer questions. Your worst homework will be discarded.

The midterm is on Thursday, Mar 21 from 12:30-1:45 PM.

The final is on Wednesday, May 8, from 1-3 PM.

The creative project must be related to course theme or to another **classic or unresolved astronomical question**. Your project, chosen with the instructor's prior approval, can take many forms, including art, video or audio presentations, musical compositions, games, plays, poems, or short stories, model building, original experiments or astronomical observations, or development of lesson plans for grade school. A report of roughly 2-3 pages must accompany those projects that do not have a written component. Abstracts or outlines of your plans for the creative project are due on Feb 12 and will be returned to you with comments and suggestions. The project itself is due on Apr 18. The instructor will show some of the more interesting projects to the class at the end of the semester.

### Interactive Learning

At the beginning of the semester, the class will be divided into eight groups. Each group will be assigned one of the eight sides of the four debate questions so that each student will participate directly in one in-class debate. On some days, one or two questions on the recent material will be posed in lecture to the class. You will then discuss the question within your debate group. One or two of these groups will be chosen at random to present the answer to the class. The rest of the class is encouraged to ask questions of the presenting group and to discuss the material. These question sessions will not only help you review important elements of the course, but also provide some experience interacting with your debate team prior to your group's classroom debate.

### Policies

- *Do your own work.* Modern science is collaborative, and people learn from

talking to each other. Feel free to talk to the instructor, TA, or other students about homework assignments. But the work you turn in must be your own--- don't just copy assignments. Copying is cheating and will be handled according to university policies. The instructor subscribes to the [University's Code of Academic Integrity](#). The Code prohibits all forms of academic dishonesty, including cheating, plagiarism, and facilitating dishonesty by others. The repercussions for those found guilty of violating the Code will include loss of credit for the work and may include failure of the course or more extreme measures.

- ***Attendance, participation, and conduct.*** Attendance and participation in class and on your debate team are an important part of your class grade. Students who are regularly absent will be dropped from the course. You must attend all four in-class debates, whose dates are already posted on the class schedule. If you know that you will be unable to attend a debate, you must talk with the instructor during the first two weeks of the course. You are strongly encouraged to participate in class by asking questions.

Eating or drinking are not permitted in the lecture hall. Talking is also prohibited unless you want to ask a question during lecture.

- ***Late Homework.*** *No credit, WITH NO EXCEPTIONS, will be given for late homework.* Because we want to be fair to those that turn in work on time, we will not accept late work. There is an absolute deadline for homeworks. If you are concerned about not being able to turn in your work in class on the due date, feel free to turn it in early! We will accept homework at any class meeting prior to the deadline.
- ***Missed Tests.*** *No makeup tests, WITH NO EXCEPTIONS, will be administered.* The exams are already scheduled and posted on the class schedule. If you know that you will miss an test, you must make arrangements for an oral exam at a time and date prior to the written test. Missing the midterm is an automatic loss of 15% of your course grade. Missing the final is a loss of 30%.
- ***There will be no makeup or extra credit assignments near the end of term.*** Do

not wait until the term's end to compensate for poor homeworks or exams.

- **Grading.** You have one week from the time an assignment or exam is returned to challenge any perceived errors. While rare, grading errors can occur, and you should review your returned work.

The final course grades will be on a curve, but rest assured that, if you have > 90% of the total number of points available, you will receive an A, 80 to 90% at least a B, 70 to 80% at least a C.

- **Students with Disabilities.** If you anticipate barriers related to the format or requirements of this course, please meet with the instructor so that we can discuss ways to ensure your full participation. If you determine that disability-related accommodations are necessary, please register with Disability Resources (621-3268; [drc.arizona.edu](http://drc.arizona.edu)) and notify the instructor of your eligibility for reasonable accommodations. We can then plan how best to coordinate your accommodations.

