WELCOME to "Black Holes"! This is a lower division course whose goal is to introduce you to some of the most exciting topics in modern astronomy and physics: the nature of black holes, the evidence for their existence, and their role in the Universe. Along the way we will study modern ideas about the nature of space, time, and gravity. This course is approved for the Arts and Sciences Core Curriculum: Natural Sciences. It does not require any CU course prerequisites. The course material will involve extensive high school math and science, though at a fairly elementary level.

Course topics

1. What are black holes?
2. What is the evidence that black holes really exist?
3. What role do black holes play in the Universe?
4. Testing physics in the extreme environment of black holes

Contacts

Prof Phil Armitage
Office JILA A909
email: pja@jila1.colorado.edu
phone: 303 492 7836

Office hours: Tuesday and Thursday 11am-noon. You are welcome to stop by to discuss the class at other times, but it's best to email first to check I'll be in the office.

TA Bryan Holler
Office Duane E122
email: astronomerbjh@gmail.com
Office hours: Tuesday and Thursday 3-4pm.

Lectures

Tuesday and Thursday, 9:30-10:45am, Duane G1B20. I will respect your schedules by finishing class on time, in return please do not disrupt your fellow students by leaving early. Although laptops and tablets can be useful for taking notes, we all know that in reality if everyone has an open laptop many people will be reading email, checking facebook, etc. To avoid distractions, no laptops, tablets or cell phones please. I will be posting copies of the lecture notes on the class web site.

Textbook

"Gravity's Fatal Attraction: Black Holes in the Universe", 2nd Edition, Mitchell Begelman and Martin Rees. This is an easy read, and although it does not include any math at all (and less on relativity than we will cover) if you understand all the concepts well you should be in good shape for the class.
Grading

Your final grade will be based upon:

40% - two midterms (20% each), on **Feb 21st** and **Apr 4th**
30% - the Final, on **Monday May 6th 1:30-4:00pm**
30% - four homeworks, your lowest score will be dropped

Extra credit

We won’t be saying much about either the fascinating story of how Einstein developed his theories of relativity, or how astronomers and physicists came to recognize that black holes are actually present in the Universe. If you're interested in these topics, there are two books I recommend:

"Einstein: His Life and Universe" by Walter Isaacson
"Black Holes and Time Warps: Einstein's Outrageous Legacy" by Kip Thorne

Up to 5% extra credit is available for reading and reviewing one of these books. Book reviews for extra credit (in the style of a book review, up to 1000 words) should be submitted no later than April 25th, in class.

General policies

We will be following the standard University policies summarized below. In a large class such as this, it is unfortunately guaranteed that a few people will run into problems of various kinds, whether they be difficulties keeping up academically, pressure of work from other classes, or personal or medical difficulties. I encourage you to inform me as soon as possible if you are having trouble; it is almost always easier to help during the semester rather than after final grades have been posted!

Bryan will be responsible for keeping track of the grades and maintaining the online records.

Accommodations for students with disabilities

If you qualify for accommodations because of a disability, please submit to me a letter from Disability Services in a timely manner (for exam accommodations provide your letter at least one week prior to the exam) so that your needs can be addressed. Disability Services determines accommodations based on documented disabilities. Contact Disability Services at 303-492-8671 or by e-mail at dsinfo@colorado.edu

Religious observances

Campus policy regarding religious observances requires that faculty make every effort to deal reasonably and fairly with all students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. Please notify me if any conflicts arise.

Classroom behavior

Students and faculty each have responsibility for maintaining an appropriate learning environment. Professional courtesy and sensitivity are especially important with respect to individuals and topics
dealing with differences of race, color, culture, religion, creed, politics, veteran’s status, sexual orientation, gender, gender identity and gender expression, age, disability, and nationalities. Class rosters are provided to the instructor with the student's legal name. I will gladly honor your request to address you by an alternate name or gender pronoun. Please advise me of this preference early in the semester so that I may make appropriate changes to my records.

Discrimination

The University of Colorado Boulder (CU-Boulder) is committed to maintaining a positive learning, working, and living environment. The University of Colorado does not discriminate on the basis of race, color, national origin, sex, age, disability, creed, religion, sexual orientation, or veteran status in admission and access to, and treatment and employment in, its educational programs and activities (Regent Law, Article 10, amended 11/8/2001). CU-Boulder will not tolerate acts of discrimination or harassment based upon Protected Classes or related retaliation against or by any employee or student. For purposes of this CU-Boulder policy, "Protected Classes" refers to race, color, national origin, sex, pregnancy, age, disability, creed, religion, sexual orientation, gender identity, gender expression, or veteran status. Individuals who believe they have been discriminated against should contact the Office of Discrimination and Harassment (ODH) at 303-492-2127 or the Office of Student Conduct (OSC) at 303-492-5550. Information about the ODH, the above referenced policies, and the campus resources available to assist individuals regarding discrimination or harassment can be obtained at http://www.colorado.edu/odh.

Honor Code

All students of the University of Colorado at Boulder are responsible for knowing and adhering to the academic integrity policy of this institution. Violations of this policy may include: cheating, plagiarism, aid of academic dishonesty, fabrication, lying, bribery, and threatening behavior. All incidents of academic misconduct shall be reported to the Honor Code Council (honor@colorado.edu; 303-735-2273). Students who are found to be in violation of the academic integrity policy will be subject to both academic sanctions from the faculty member and non-academic sanctions (including but not limited to university probation, suspension, or expulsion). Other information on the Honor Code can be found at http://www.colorado.edu/policies/honor.html and at http://www.colorado.edu/academics/honorcode/.