

# ASTR 3730-001: ASTROPHYSICS 1

**Syllabus: FALL 2018**

**Lectures:** TTh, 12:30-1:45 pm, Duane G131

**Online material accessible at CU Canvas:**

<https://canvas.colorado.edu/>

**Contact Information:**

**Prof. Mitchell Begelman**

**Room A-808, JILA Tower**

**Email:** [mitch@jila.colorado.edu](mailto:mitch@jila.colorado.edu)

**Phone:** 303-492-7856

Office hours: 3:30-4:30 Tuesday and Thursday, or by appointment (send me an email and I will respond ASAP)

**Course Description:**

This course is the first part of yearlong introduction to astrophysics. The goal is to show you how we can apply basic physical principles (gravity, fluid dynamics, quantum mechanics, etc.) to understand the properties of astronomical objects. The focus during this semester will be on stars and objects within our own Galaxy; this will lead on to ASTR 3830 in the Spring which will concentrate on extragalactic astrophysics.

**Prerequisites:**

Completed Physics III (PHYS 2130 or 2170), and Calculus III (MATH 2400 or APPM 2350), with C- grades or better. These are prerequisites, not co-requisites.

**Topics to be covered include:**

- Radiation processes from stars and interstellar gas
- Formation, structure and evolution of stars
- The physics of stellar remnants - white dwarfs, neutron stars and black holes

### **Books:**

*“An Introduction to Modern Astrophysics”* (Bradley Carroll and Dale Ostlie, 2<sup>nd</sup> edition, Addison Wesley) is the official required text for the course. This is a comprehensive text that goes into considerable detail on most topics. It is a bit daunting, but you will probably find it useful as a reference.

*“Astrophysics in a Nutshell”* (Dan Maoz, Princeton). This is a concise introduction, at a level comparable to or slightly lower than the lectures. This is an optional text, which you may find useful if you want a broad overview without too much detail.

### **Course Requirements and Grading Policy:**

**Exams:** There will be two midterm exams in class, scheduled for Thurs. Oct. 11 and Tues. Nov. 13. There will be a final exam on Wed. Dec. 19, 4:30–7:00 pm.

**Homeworks:** There will be regular written problem sets, which will be graded and count toward the course grade. Doing these problems is the core of the course, and should also be very helpful preparation for the exams.

**Grading:** The course grade will be determined based upon the homework (40%, your worst homework grade will be discarded and not count), the in-class exams (30%), and the final (30%). I will give some guidance as to how your marks (up to that point) translate into letter grades following the first in-class exam, so that you have a rough idea of how you’re doing.

### **General policies:**

We will be following the standard University policies summarized below. I encourage you to inform me as soon as possible if you run into problems of various kinds, such as difficulties keeping up academically, pressure of work from other classes, or personal or medical difficulties; it is almost always easier to help during the semester rather than after final grades have been posted!

### **Accommodations for students with disabilities:**

Students and faculty each have responsibility for maintaining an appropriate learning environment. Those who fail to adhere to such behavioral standards may be subject to discipline. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with race, color, national origin, sex, pregnancy, age, disability, creed, religion, sexual orientation, gender identity, gender expression, veteran status, political affiliation or political philosophy. 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. For more information, see the policies on [classroom behavior](#) and the [Student Code of Conduct](#).

### **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. See [campus policy regarding religious observances](#) for full details.

### **Classroom behavior:**

Students and faculty each have responsibility for maintaining an appropriate learning environment. Those who fail to adhere to such behavioral standards may be subject to discipline. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with race, color, national origin, sex, pregnancy, age, disability, creed, religion, sexual orientation, gender identity, gender expression, veteran status, political affiliation or political philosophy. 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. For more information, see the policies on [classroom behavior](#) and the [Student Code of Conduct](#).

**Please switch off phones; laptops and tablets should only be used for taking notes.**

### **Sexual Misconduct, Discrimination, Harassment and/or Related Retaliation:**

The University of Colorado Boulder (CU Boulder) is committed to fostering a positive and welcoming learning, working, and living environment. CU Boulder will not tolerate acts of sexual misconduct (including sexual assault, exploitation, harassment, dating or domestic violence, and stalking), discrimination, and harassment by members of our community. Individuals who believe they have been subject to misconduct or retaliatory actions for reporting a concern should contact the Office of Institutional Equity and Compliance (OIEC) at 303-492-2127 or [cureport@colorado.edu](mailto:cureport@colorado.edu). Information about the OIEC, university policies, [anonymous reporting](#), and the campus resources can be found on the [OIEC website](#).

Please know that faculty and instructors have a responsibility to inform OIEC when made aware of incidents of sexual misconduct, discrimination, harassment and/or related retaliation, to ensure that individuals impacted receive information about options for reporting and support resources.

### **Honor Code:**

All students enrolled in a University of Colorado Boulder course are responsible for knowing and adhering to the Honor Code. Violations of the policy may include: plagiarism, cheating, fabrication, lying, bribery, threat, unauthorized access to academic materials, clicker fraud, submitting the same or similar work in more than one course

without permission from all course instructors involved, and aiding academic dishonesty. All incidents of academic misconduct will be reported to the Honor Code ([honor@colorado.edu](mailto:honor@colorado.edu); 303-492-5550). Students who are found responsible for violating the academic integrity policy will be subject to nonacademic sanctions from the Honor Code as well as academic sanctions from the faculty member. Additional information regarding the Honor Code academic integrity policy can be found at the [Honor Code Office website](#).