

Physics/Philosophy 4450, 5450
History and Philosophy of Physics
Spring 2024
Prof. Michael H. Ritzwoller

Tuesday & Thursday 12:30 PM – 1:45 PM
Location: G1B35, Duane Physics

Instructor Information: Michael Ritzwoller
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TA Information: Tyler McMaken, tyler.mcmaken@colorado.edu

Reading Materials:

Stephen Toulmin & June Goodfield– *The Fabric of the Heavens: The Development of Astronomy and Dynamics*

Peter Godfrey-Smith – *Theory and Reality: An Introduction to the Philosophy of Science*

Richard S. Westfall – *The Life of Isaac Newton* (Note: This is a condensed version of Westfall’s much longer treatise called *Never At Rest*.)

Note: All three books will be available at the CU Book Store but may not be available for some time, so ordering online might be best. Also, online sources may be less expensive than the CU Bookstore.

Additional readings will be made available to students via Canvas.

Grading: There will be weekly homeworks and 2-3 papers. Attendance and class participation will also be weighted strongly in the final letter grade. Homeworks will be about 40% of the grade, the papers will be about 40%, and class participation will be about 20%.

Policy on Late Assignments:

- Homeworks will not be accepted late. One homework grade at the end of the semester will be dropped.
- Late submissions on papers will be penalized at the rate of one grade position per day on the following scale: A, A-, B+, B, B-, C+, C, C-, D+, D, D-, F. For example, a paper that would have earned a B if submitted on time will, if handed in two days late would receive a C+. Exceptions to this policy are restricted to those situations in which I have a written excuse from a physician or your academic adviser. Basically, except in extraordinary circumstances, you’re expected to hand in your assignments on time.

Overview of the Course: The course will start with the history of physics and move on to discuss problems in the philosophy of science on which 20th century philosophers focused. As we will see, many of these problems have deep historical antecedents.

The course will be organized into two sections:

1. The history of physics from the Babylonians through Newton – which we will see as the development of modern physical theories of dynamics and cosmology,
2. An overview of some of the principal ideas and problems considered in 20th Century philosophy of science.

The books listed above by Toulmin, Westfall, and Godfrey-Smith will sequentially form the nucleus of the readings in each section of the class but will be supplemented by other commentaries and original source materials.

Compared to classes in physics and engineering, there will be a lot of reading in this class. The successful student will embrace this aspect of the class.

For the CU syllabus statements regarding accommodation for disabilities and temporary medical conditions, classroom behavior, requirements for infectious diseases, preferred student names, the honor code, sexual misconduct, mental health and wellness, discrimination, harassment and/or related retaliation, and religious holidays – see below.

SYLLABUS STATEMENTS

Classroom Behavior

Students and faculty are responsible for maintaining an appropriate learning environment in all instructional settings, whether in person, remote, or online. Failure 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.

For more information, see the [classroom behavior policy](#), the [Student Code of Conduct](#), and the [Office of Institutional Equity and Compliance](#).

Requirements for Infectious Diseases

Members of the CU Boulder community and visitors to campus must follow university, department, and building health and safety requirements and all public health orders to reduce the risk of spreading infectious diseases.

The CU Boulder campus is currently mask optional. However, if masks are again required in classrooms, students who fail to adhere to masking requirements will be asked to leave class. Students who do not leave class when asked or who refuse to comply with these requirements will be referred to Student Conduct & Conflict Resolution. Students who require accommodation because a disability prevents them from fulfilling safety measures related to infectious disease will be asked to follow the steps in the “Accommodation for Disabilities” statement on this syllabus.

For those who feel ill and think you might have COVID-19 or if you have tested positive for COVID-19, please stay home and follow the [further guidance of the Public Health Office](#). For those who have been in close contact with someone who has COVID-19 but do not have any symptoms and have not tested positive for COVID-19, you do not need to stay home.

Accommodation for Disabilities, Temporary Medical Conditions, and Medical Isolation

[Disability Services](#) determines accommodations based on documented disabilities in the academic environment. If you qualify for accommodations because of a disability, submit your accommodation letter from Disability Services to your faculty member in a timely manner so your needs can be addressed. Contact Disability Services at 303-492-8671 or dsinfo@colorado.edu for further assistance.

If you have a temporary medical condition or required medical isolation for which you require accommodation, please see to let me know the situation. Also see [Temporary Medical Conditions](#) on the Disability Services website.

Preferred Student Names and Pronouns

CU Boulder recognizes that students' legal information doesn't always align with how they identify. Students may update their preferred names and pronouns via the student portal; those preferred names and pronouns are listed on instructors' class rosters. In the absence of such updates, the name that appears on the class roster is the student's legal name.

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 Honor Code may include but are not limited to: plagiarism (including use of paper writing services or technology [such as essay bots]), 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 Student Conduct & Conflict Resolution: honor@colorado.edu, 303-492-5550. Students found responsible for violating the [Honor Code](#) will be assigned resolution outcomes from the Student Conduct & Conflict Resolution as well as be subject to academic sanctions from the faculty member. Visit [Honor Code](#) for more information on the academic integrity policy.

SEXUAL MISCONDUCT, DISCRIMINATION, HARASSMENT AND/OR RELATED RETALIATION

CU Boulder is committed to fostering an inclusive and welcoming learning, working, and living environment. University policy prohibits [protected-class](#) discrimination and harassment, sexual misconduct (harassment, exploitation, and assault), intimate partner violence (dating or domestic violence), stalking, and related retaliation by or against members of our community on- and off-campus. These behaviors harm individuals and our community. The Office of Institutional Equity and Compliance (OIEC) addresses these concerns, and individuals who believe they have been subjected to misconduct can contact OIEC at 303-492-2127 or email cureport@colorado.edu. Information about university policies, [reporting options](#), and support resources can be found on the [OIEC website](#).

Please know that faculty and graduate instructors have a responsibility to inform OIEC when they are made aware of incidents related to these policies regardless of when or where something occurred. This is to ensure that individuals impacted receive an outreach from OIEC about their options for addressing a concern and the support

resources available. To learn more about reporting and support resources for a variety of issues, visit [Don't Ignore It](#).

Religious Holidays

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. In this class, please let me know if you need to miss a class or an assignment due to a religious holiday. See the [campus policy regarding religious observances](#) for full details.

Mental Health and Wellness

The University of Colorado Boulder is committed to the well-being of all students. If you are struggling with personal stressors, mental health or substance use concerns that are impacting academic or daily life, please contact [Counseling and Psychiatric Services \(CAPS\)](#) located in C4C or call (303) 492-2277, 24/7.

Free and unlimited telehealth is also available through [Academic Live Care](#). The Academic Live Care site also provides information about additional wellness services on campus that are available to students.