

**Professor Jack Burns, Ph.D.**

**Department of Astrophysical & Planetary Sciences**

**Office:** Stadium 120B

**Office Hours:** Monday at 1 pm and Thursday at 2 pm, or by appointment

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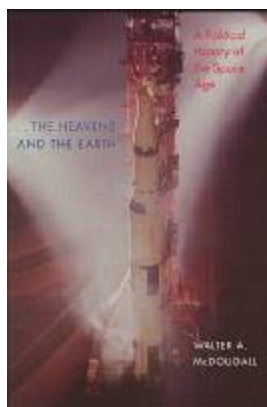
**Teaching Assistant**

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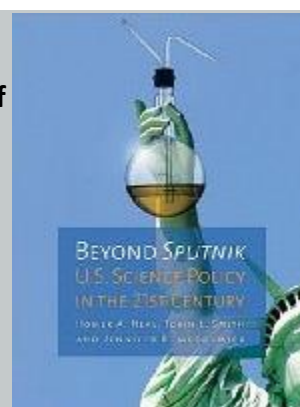
**Office:** Stadium 123A

**Required Texts:**



**The Heaven and the Earth: A Political History of the Space Age**, 1997 by Walter A. McDougall, Johns Hopkins Press

**Beyond Sputnik: U.S. Science Policy in the 21st Century**, 2008 by H. Neal, T. Smith, and J. McCormick.



**Course Description:**

Students will be exposed to current controversies in science that illustrate the scientific method and the interplay of observation, theory, and science policy. Students will research and debate both sides of the issues, which include strategies and spin-offs of space exploration, funding of science, big vs. small science, and scientific heresy and fraud. Approved for the arts and sciences core curriculum: critical thinking.

**Course Prerequisites:**

None are required. But, ASTR 1110 and 1120, or PHYS 1110 and 1120, or PHYS 2010 and 2020 or equivalents would be helpful before taking this class.

**Course Objectives:**

1. How does NASA's history give us perspective on the Agency's present programs and its vision for the future of the U.S. space program?
2. What is the rationale for federal support of scientific research in space, in particular, space astronomy? What fraction of the federal budget goes to basic science? To astronomy? What federal agencies support astronomy and what are their missions?
3. How do scientists interact with policymakers in Congress and the White House? How are scientific priorities established? How is the budget allocated? How/when do scientists bring issues to the attention of policy makers? How/when do policy makers seek information from scientists?
4. What are the scientific objectives, costs, and scientific impact of current space astronomy instruments such as the Hubble Space Telescope, Kepler, and the JUNO probe to Jupiter, as well as future observatories such as the James Webb Space Telescope, and lunar-based telescopes?

### **Strategies for Reaching the Objectives:**

- Text chapters and other web materials should be read and thoughtfully analyzed before class so that you are prepared to discuss issues, articulate insights, evaluate others' ideas, and defend your own ideas. Participate in discussions of topics by asking original questions, bringing in outside research articles to share with the class, and relating your own experiences or observations.
- Find time to read updates and articles on NASA and the space program at least weekly. You will be asked to discuss one or more such articles in class and how these articles relate to the learning objectives. Some potential resources include Space News (published weekly and in the library) as well as on-line sites such [space.com](http://space.com), [spacedaily.com](http://spacedaily.com), [thespacereview.com](http://thespacereview.com), and <http://science.nasa.gov>.
- Make PowerPoint presentation to the class at least once during the semester showing your in-depth research on one of the themes, topics, missions, policies, or science issues in the [class schedule](#).
- Begin research early on your mid-term and final papers.
- Late assignments will not be accepted unless arrangements are made in advance.

### **Class Web page:**

<http://lunar.colorado.edu/~jaburns/astr4800>

### **Exams:**

Short essay examinations will be given twice during the semester, the first about a third of the way through the class and the second about two-thirds of the way through the semester. These exams will ask you to discuss, analyze, and interpret issues presented in class.

### **In-Class Participation:**

Regular individual participation in class discussion is a critical part of this class. Points will be earned for the quality and quantity of your in-class participation. Participation will also include regular in-class exercises, and one or two brief (5 minute) presentations at the beginning of class on “Space in the News” – recent topical articles that describe “hot” issues in Space Science or Space Policy (see above for potential sources of articles).

List of *Space in the News* Student Presenters is given here: <http://lunar.colorado.edu/~jaburns/publicfiles/SiNsignup.pdf>

### **Homework:**

Homework assignments will be given on occasion throughout the semester. These assignments may include calculations, short essays, and interpretations of articles.

### **Class Presentations:**

Every student will make at least one PowerPoint presentation to the class on one of the topics described under [Schedule](#) tab on the website or will participate as part of a team in one of the debate topics. Careful preparation, including at least one meeting with me, good presentation materials, practice, and reading materials for the class will all contribute to this portion of the grade.

List of Class Presentations and Student Presenters is given here: <http://lunar.colorado.edu/~jaburns/publicfiles/PresentSignup.pdf>

### **Papers:**

Two papers will be written during the semester. The first midterm paper is a 5 page essay that describes an interview that you've conducted with a Space Scientist. Your interviewee must be approved in advance. Guidelines for this paper are given here:

The final paper, in lieu of a Final Exam, will be a 10-page essay that will describe your vision of NASA if you were selected as the NASA Administrator. It must present a vision and goals statement for the Agency, a budget table for the next fiscal year (and the subsequent 4 years for a total of a 5-year budget), and strategy on how you will sell your budget and plans to Congress. Guidelines for this paper are given here:

### **Individual Attendance:**

Daily class attendance is expected and is an individual responsibility. There will be regular in-class exercises that will be graded as part of your class participation grade. An occasional interview or illness may cause you to miss class, but excessive absences will be penalized in the point distribution system. If you need to miss class, please let me know before class via E-mail or a written note.

**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 see me in advance to discuss accommodations with any conflict.

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

**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.

**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](#).

**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](#).

### **Disability Services:**

If you qualify for accommodations because of a disability, please submit your accommodation letter from Disability Services to your faculty member in a timely manner so that your needs can be addressed. Disability Services determines accommodations based on documented disabilities in the academic environment. Information on requesting accommodations is located on the [Disability Services website](#). Contact Disability Services at 303-492-8671 or [dsinfo@colorado.edu](mailto:dsinfo@colorado.edu) for further assistance. If you have a temporary medical condition or injury, see [Temporary Medical Conditions](#) under the Students tab on the Disability Services website.

### **E-Mail:**

**I will be communicating weekly with you via E-mail on class assignments, reading articles, paper preparation, etc. It is essential that you log onto your official CU E-mail account at least twice weekly to read these communications!**

### **Grading:**

25% Class participation, homeworks, and Space in the News presentations.  
25% Exams  
20% Class Presentation  
10% Midterm paper  
20% Final paper