Term Essay Assignment

(Due Friday, 19 May, by 5 pm in the Physics 1 mailbox)

Select one of the five topics below for your term essay. This essay should be five-to-six pages (ca. 1250 words) in length, and should include a bibliography and citations for all sources used. See Dartmouth’s booklet, Sources: Their Use and Acknowledgment, 1998 (http://www.dartmouth.edu/~sources), if you are unsure about when or how to cite.

Remember that good essays present a thesis or central argument, supported with specific evidence offered in a clearly organized manner.

Since many of you will be working on identical topics, we have placed all works listed below on closed four-hour reserve in Kresge Library. Check Course Reserves on the Library website to confirm availability. Note that several of the articles and both plays have been scanned and are available as pdf files. And note that the sources below are only suggestions; you can of course consult other sources. The reference librarians in Kresge Library stand ready to assist your research on these topics.

To ease the pressure on the Kresge Reserve desk, you may browse the books (on open shelves beside the circulation desk in Kresge) without checking them out. But once you select a book, please check it out so that the Library staff can keep track of all reserve items. Please let us know if you encounter problems obtaining materials required for writing your essay.

Topic 1: Physics. Ethics, and Playwrights

At times, individual physicists have faced decisions about how to employ or deploy their science that have had momentous political or moral consequences. Among the best known of such cases are Galileo’s decision to challenge the Catholic Church and Werner Heisenberg’s work on the German nuclear project during World War II. Write an essay exploring the nature of the ethical choices made either by Galileo or Heisenberg. For Galileo, begin with German playwright Bertold Brecht’s telling of the story, and contrast that telling with accounts written by historians. For Heisenberg, begin with the British playwright Michael Frayn’s portrayal of a meeting in fall of 1941 between Heisenberg and Niels Bohr.


**Topic 2: Physics and Big Experiments**

Since 1945, much research in physics increasingly has come to depend on the construction and operation of massive, expensive machines. The Superconducting Super Collider (SSC) was to have been the largest machine ever built for physics—a particle accelerator 52 miles in diameter, projected to cost about $6 billion over the 10 years required for its construction. In 1989, the US Congress voted overwhelmingly to fund the project. In 1993, the Congress killed the project by an equally overwhelming vote, even after nearly $2 billion already had been poured into preliminary construction in Texas. Using the analyses by historians Kevles and Riordan and contemporary news accounts (*New York Times*, *Science*, Lexis/Nexis database, etc.), write an essay explaining why the SSC did not survive, exploring the relations between physics, politics and the American tax-paying public.


Riordan, Michael “The demise of the superconducting super collider.” *Physics in perspective* 2 (2000), 411-25. (e-journal, not on reserve)

**Topic 3: Images of Physicists in Popular Culture, Literature, Art, Etc.**

Ever since Newton, a relatively select group of physicists have become cultural heroes. For various reasons, these individuals captured the public imagination; their lives, physics and faces appeared in literature, plays, paintings, advertising, etc. Write an essay exploring how Isaac Newton or Albert Einstein have been presented in a particular literary, artistic or other cultural work. The core of your paper should be the analysis of a specific text or visual image. For ideas on appropriate texts or images for Newton and Einstein, see the following works. Please check with us before you write an essay on cultural images of someone other than Newton or Einstein. For additional ideas, see the “Bibliography: Relations of Science to Literature and the Arts,” published annually in *Configurations*, available as an on-line journal through the Dartmouth Library catalogue.


**Topic 4: Autobiographical musings of physicists**

Why do some individuals choose to become physicists? What makes a truly great (as opposed to an ordinary) physicist? How do physicists select their special research topics from the broad array of topics comprising physics more generally? Do physicists,
because of their particular work in science, adhere to any particular worldview, or political, religious or social outlook? How have physicists themselves answered these questions? Write an essay exploring what, if anything, makes physicists special by analyzing a physicist’s autobiography.


Curie, Eve. *Madame Curie, a biography*. New York, 1937. [by a daughter]


**Topic 5: You define the topic**

You may also define your own topic, provided that it relates to themes of the course. For this option, you must submit a one-page description of your proposed topic with preliminary bibliography to one of the professors for their signed approval by Wednesday, 28 April. You should then attach this approved proposal, bearing one of the professor’s signatures, to your term essay when you submit it.

**Topic 6: Produce Stoppard’s Arcadia (Available only to 6 students)**
You will perform this dramatic exploration of time’s direction, history, physics, and, of course, love for the class (and guests!) on Thursday evening, 18 May (or a date that you arrange). As a group, you will organize yourselves to prepare the script (some abridgment may be in order), cast and rehearse actors/readers, arrange props and program notes, and perform or read the play. Professor Gleiser will work with this group as necessary.
PHYS 1 Sources for Term Essay

Reserve Books
Books selected by your professors are on reserve in Kresge Library, on the shelves next to the circulation desk so you can browse them. Pick what books you want to use and take them to the circulation desk even if you are just going to use them in the library. Be considerate of the other students in the class and return the materials on time. These reserve materials are due back 2 hours after they are checked out. If a book would be due back after the library has closed it will instead be due back one hour after the library opens the following day.

Reserve items may only be renewed in person, with the item in hand, and only if there is no one on the waiting list. Unlike regular library materials, they may not be renewed by phone or email, or at another library.

If material you want is checked out, you can put your name on a waiting list. You must be in the library in order to receive the item when it is returned. Kresge circulation student assistants will notify you when the book becomes available, as long as you are in Kresge and let the student assistant know where to find you. If you are not in the library, the reserve book will not be held for you; it will instead be made available for circulation.

Other Books, Journals and Reports
There are many other sources for your term essay, including books, journal articles and government reports. The librarians can help you identify and find these materials. Excellent indexes to use for journal articles for these topics include the following:

WilsonWeb includes all these indexes, mostly mid-1980’s to present:

Applied Science Abstracts
Indexes about 390 technical journals, including: Physics Today, New Scientist

General Science Abstracts
Indexes about 135 popular science and multidisciplinary journals, including: American Journal of Physics, American Scientist, Endeavour, Nature, Physics Teacher, Science, Scientific American

Humanities Abstracts
Indexes about 350 popular and scholarly journals in the humanities; covers history, philosophy, and literature, including: History of Science, Journal of American History, Isis, History Today, Studies in History and Philosophy of Science (later Physics)

Readers Guide Retrospective 1890-1982
Indexes popular, general interest journals and magazines in all subject areas including science. Usefull for getting the contemporary view of events in the past century.

History of Science, Technology and Medicine 1975-to date
Print: Isis Cumulative Bibliography,1913-1975 Baker/Berry Stacks Z/7405/H6/12
Indexes about 600 scholarly journals covering the history, philosophy and sociology of science with partial contents of several hundred more.
**Web of Science** 1900-present
All topics covered including history of science, drama and general science; cited reference search allows you to find out papers that have cited a particular paper or author.

**Getting help**
Save time by getting help with your research early in the process. Stop by Kresge or Baker/Berry during reference hours or blitz the librarians to set up a research appointment.
Kresge Librarians:
Barbara DeFelice
Jane Quigley
Ann Perbohner
Library web pages:
http://www.dartmouth.edu/~krescook/  Kresge Library
http://www.dartmouth.edu/~refweb/  Baker/Berry Reference