This seminar explores the cultural history of the physical sciences at key moments from the seventeenth through the nineteenth century. We will immerse ourselves in the cultural, social, and political concerns of diverse historical actors as we ask: How did the study of natural philosophy gradually morph into the disciplines we recognize today as physics, astronomy, chemistry, and the earth sciences? How did energy regimes transform across this period, and how were these transformations related to novel physical ideas? How did industrial development, new artistic expressions, and technological innovation emerge in tandem with the creations and practices of physical science?

Each week, we will closely read sources (primary, secondary, or both) that express the curiosity, discoveries, frustrations, and interconnected worlds of the natural philosophers, craftsmen, scientists, authors, artists, and other practitioners engaging the scientific and technological developments of their time. To aid in developing a historicist sensibility – to look at the past on its own terms and learn to think as past historical actors thought – every week you will post to the discussion board on the course website a focused short response (of about 100-200 words) to the week’s readings – either as a new post or in response to another student’s post (by providing another example, counter-example, observation, or supportive analysis to what was already posted). All responses and comments should be written in complete sentences (as paragraphs or bullet-points), must be polite, and should be constructive if critiquing other comments. In most weeks I will have provided some questions to help you contextualize and close-read the texts, but you are most welcome (and encouraged) to also post questions and responses on other aspects of the texts that puzzle or intrigue you.

On the first day of class, you will sign up to be the “Synthesizer” for one week: your role that week will be to read through the responses on the discussion board before class and prepare a short (approximately 5-minute) in-class presentation on some of the key highlights, questions, debates, and examples given by yourself and your peers. This will assist in jumpstarting discussion in class.

The main assignment for the course will be a 10-page to 15-page final paper based on your own historical research. The topic may mesh closely with one of the case-studies, scientific disciplines, historical persons, or comparative themes that we read about and discuss in the course. Alternatively, you could research any topic related to the physical sciences in the 17th through 19th centuries, in any region of the world.

The paper will be primarily historical, but you are free to bring your own knowledge or methodologies from the sciences, philosophy, literature, art history, sociology, anthropology,
and so forth into your analysis in the paper. Carefully perusing this syllabus and the readings in future weeks will provide you with many possible subjects and questions to consider. The sooner you start brainstorming possible topics and arguments – and the sooner you discuss your ideas with me – the better in order to have a chance to refine your topic and questions, to find materials to strengthen your argument, and to have time to draft and revise your final paper.

By October, you are required to meet with me at my office-hours as you begin planning your final paper topic and argument. On October 24 by 6pm, you will submit a thesis statement, draft outline, and bibliography for the final paper, and I will provide you with further suggestions and feedback. In the week before Thanksgiving break, you will be required to meet with me by appointment to discuss your progress on your final paper research. The final paper will be due by 5pm on December 9.

Course Assignments and Grading:

Class participation (attendance and discussion): 20%
Weekly online discussion (response essays) based on readings: 25%
Short in-class Presentation: 10%
Thesis, Outline, and Bibliography for final paper (Due October 24, at 6pm): 20%
Final Paper (Due December 9, at 5pm): 25%

Readings:

All readings are on the course website – please bring the readings to class.

Schedule and Readings

September 3: Introduction and Overview

- Overview the course topics, schedule, and expectations; participant introductions
- Brief introduction to Waywiser to search Collection of Historical Scientific Instruments, which you are encouraged to explore: http://waywiser.fas.harvard.edu/collections
- Presentation by history of science librarians about resources in library and online: Widener Fred (burchst@fas.harvard.edu) & Lamont Emily (emilybell@fas.harvard.edu)

Part I: 17th Century to Early 18th Century: The Baroque

September 10: Experience/Experiment: The Mathematization of Nature?


**September 17: Manufacturing, Arts, and Instruments of Knowledge**


**September 24: Instruments of Navigation and Other Worlds**


**Part II: 18th-Century to Early-19th-Century: Revolutions**

**October 1: The French Enlightenment, Revolution, and Napoleonic Science**


**October 8: The Industrial Revolution: Power, Time, and Work**

October 15: Revolutions in Geology and Optics: Deep History and Spectroscopy


**Thursday, October 24, at 6:00pm – Preliminary Thesis Statement, Outline, and Bibliography for your final paper Due**

Part III: 19th-Century: Accelerating Transformations

October 22: Thermodynamics, Energy, and Labor


October 29: Astronomy, Statistics, and the Personal Equation


November 5: On Light, Molecules, Saturn’s Rings, and Electromagnetism

Part IV: Late-19th-Century: Modernization

November 12: Electrification, Telegraphy, Empire

November 19: Physics, Chemistry, Industry, and Pure Research

N.B. Will send email for scheduling to meet with me about your final paper before Thanksgiving Break.

November 26: NO CLASS TODAY – DISCUSS FINAL PAPER
Happy Thanksgiving!

December 3: Precision Experiments: Speed of Light and Electrons

READING PERIOD: December 4-9

Monday, December 9, at 5:00pm – Final Paper Due