

HISTORY OF SCIENCE 623 / HISTORY 323
Studies in Early Modern Science
Fall 2007
5:00-6:00pm T
6105 Social Science

instructor: Florence Hsia
office: 7137 Social Science
office hours: 11:00am-1:00pm Wednesday and by appt.
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COURSE REQUIREMENTS

Fulfill requirements for History of Science/History 323, and attend an additional "weekly" seminar. You'll be asked to take turns presenting the materials assigned for HoS 623 (the number of presentations will depend on the number of seminar participants). A typed summary/critique (1 page in length) should accompany each of your presentations; please make copies for all seminar participants.

In lieu of the midterm and final exercises for HoS 323, you should complete 15-20 pages of prose writing in connection with this course, e.g.: a research paper, based on primary sources in early modern European science; a critical discussion of some historiographical issue in the secondary literature; two or more book reviews (situate the book with respect to existing scholarship and critique the author's use of source material); or a bibliographic survey in preparation for a prelim field. Please see me as early as you can in the semester to discuss how you propose to fulfill the writing requirement.

You should be prepared to present a prospectus and preliminary bibliography to the seminar on **April 15**. We will discuss written work-in-progress on **May 6** (please email your draft to all seminar participants by **April 29**.) All of your written work is due **Tuesday, May 13, by 2:00pm**. Grading will be based on class participation (~25%), presentations (~25%), and the written work (50%).

SCHEDULE OF READINGS AND MEETINGS

- | | |
|---------|--|
| Jan. 22 | introductions |
| Jan. 29 | historiographical perspectives <ul style="list-style-type: none">• Mario Biagioli*, "The Scientific Revolution is undead," <i>Configurations</i> 6, no. 2, (1998): 141-48• Margaret J. Osler, "The canonical imperative," in <i>Rethinking the scientific revolution</i>, ed. Osler (Cambridge, 2000), pp. 1-22 |
| Feb. 5 | visual evidence <ul style="list-style-type: none">• Owen Hannaway*, "Laboratory design and the aim of science: Andreas Libavius versus Tycho Brahe," <i>Isis</i> 77 (1986): 585-610; reprinted in <i>The scientific enterprise in early modern Europe</i>, ed. by Peter Dear (Chicago, 1997)• Jole Shackelford*, "Tycho Brahe, laboratory design, and the aim of science: reading plans in context," <i>Isis</i> 84 (1993): 211-30 |
| Feb. 12 | Kuhnian paradigms <ul style="list-style-type: none">• Robert S. Westman*, "Two cultures or one? A second look at Kuhn's <i>The Copernican revolution</i>," <i>Isis</i> 85 (1994): 79-115• Robert S. Westman*, "The Melanchthon circle, Rheticus, and the Wittenberg interpretation of the Copernican theory," <i>Isis</i> 66 (1975): 165-93; reprinted in <i>The scientific enterprise in early modern Europe</i>, ed. by Peter Dear (Chicago, 1997) |

- Feb. 19 **scientific patronage**
- Richard S. Westfall*, "Science and patronage," *Isis* 76 (1985): 11-30; reprinted in *The scientific enterprise in early modern Europe*, ed. by Peter Dear (Chicago, 1997)
 - Mario Biagioli, "Galileo's system of patronage," *History of science* 28 (1990): 1-62
- Feb. 26 no meeting
- Mar. 4 Special Collections: Sacrobosco
- Mar. 11 **the Merton thesis and scientific institutions**
- Gary A. Abraham*, "Misunderstanding the Merton thesis: a boundary dispute between history and sociology," *Isis* 74 (1983): 368-87; abridged in *Puritanism and the rise of modern science: the Merton thesis*, ed. I. Bernard Cohen, New Brunswick: Rutgers University Press, 1990, pp. 233-45
 - Robert K. Merton, "Motive forces of the new science [1938]," reprinted in *Puritanism and the rise of modern science: the Merton thesis*, ed. by I.B. Cohen (Rutgers, 1990), pp. 112-31; skim the appendix (pp. 373-89), which outlines Merton's *Science, technology and society in seventeenth-century England* (1938)
 - Steven J. Harris, "Transposing the Merton thesis: apostolic spirituality and the establishment of the Jesuit scientific tradition," *Science in context* 3 (1989): 29-65
- Mar. 18 spring break
- Mar. 25 **scientific communities**
- David S. Lux and Harold J. Cook, "Closed circles or open networks?: communicating at a distance during the Scientific Revolution," *History of science* 36 (1998): 179-211
 - Steven J. Harris*, "Long-distance corporations, big sciences, and the geography of knowledge," *Configurations* 6 (1998): 269-304
 - Londa Schiebinger*, "Maria Winkelmann at the Berlin Academy," *Isis* 78 (1987): 174-200; reprinted in *The scientific enterprise in early modern Europe*, ed. by Peter Dear (Chicago, 1997)
- April 1 no meeting
- April 8 **scientific audiences**
- Stephen D. Snobelen, "'God of gods, and lord of lords': the theology of Isaac Newton's General Scholium to the *Principia*," *Osiris* 16 (2001): 169-208
 - Steven Shapin*, "Of gods and kings: natural philosophy and politics in the Leibniz-Clarke disputes," *Isis* 72 (1981): 187-215
- April 15 presentations of prospectus and preliminary bibliography
- April 22 no meeting
- April 29 no meeting; please email your draft to all seminar participants
- May 6 discussion of drafts
- May 13 (Tu) **All written work is due by 2:00pm**

HISTORY OF SCIENCE 323 / HISTORY 323
The Scientific Revolution: from Copernicus to Newton
Spring 2008
1:00pm-2:15pm TuTh
B223 Van Vleck

instructor: Florence Hsia
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office hours: 11:00am-1:00pm Wednesdays and by appt.
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COURSE DESCRIPTION

This course investigates the renaissance and revolution in European science that began in 1543 with the heliocentric astronomy of Nicolaus Copernicus and ended with Isaac Newton's death in 1727. We will pay particular attention to issues of tradition and novelty, institutional settings for scientific activity, and the relationship between science and religion. Topics covered will include the Copernican cosmology and the trial of Galileo, the mechanical philosophy, Newton's theory of gravitation, the appearance of new scientific organizations such as the Royal Society of London and the Paris Academy of Sciences, the role of science in European exploration and expansion, and perceptions of the scientist's place in society.

This class also emphasizes the skills of analyzing historical documents and of constructing persuasive arguments about historical questions. It is therefore extremely important that you complete the readings assigned for each class session before coming to class. Please bring the readings – especially those in the Course Reader – to class with you.

COURSE REQUIREMENTS AND GRADING

1. Attend classes.
2. Prepare assigned readings.
3. Grades will be based on two (2) in-class group presentations and three (3) take-home essay exams. Grades will be calculated using the following rough guidelines:

two (2) in-class presentations, March 11/13 + April 24/29	~25%
exam 1 due in class, March 4 (Tu)	~25%
exam 2 due in my mailbox, April 22 (Tu)	~25%
exam 3 due by 2:00pm, May 13 (Tu)	~25%

Honors students need to complete an honors assignment. Please see me for details.
Graduate students should also enroll in History of Science 623 (for assignments, see the HoS 623 syllabus.)

COURSE POLICIES

I will make every effort to honor requests for reasonable accommodations made by individuals with disabilities. If you think you may qualify for accommodation, please contact the McBurney Disability Resource Center at 263-2741 (<http://www.mcburney.wisc.edu/>) to establish your eligibility for services. If you require such accommodation, please let me know as soon as possible in the semester. All requests are confidential.

Academic honesty is expected of students at the University of Wisconsin-Madison in compliance with the student code of conduct. All written work that you turn in under your name should be solely your work. Both paper and internet sources must be acknowledged; failure to understand what counts as plagiarism is not an adequate excuse. Plagiarism and other forms of academic misconduct carry penalties. Feel free to talk to me if you have any questions about how to properly cite sources in your written work. You can also consult the Writing Center's guide to quoting sources (<http://www.wisc.edu/writing/Handbook/QuotingSources.html>).

TEXTBOOKS

- Course Reader (purchase in the History of Science dept. office, 7130 Social Science; no returns)
- Peter Dear, Revolutionizing the sciences, Princeton 2001 (purchase at the University Book Store, 711 State Street)

SCHEDULE OF ASSIGNMENTS AND TOPICS

CR = Course Reader

D = Dear, Revolutionizing the sciences (2001)

Jan 22 (T)	introduction
Jan 24 (Th)	scientific renaissance CR, 1-26 Vesalius, <u>On the fabric of the human body</u> (1543), selections D, 1-9, 30-33, 37-41 [intro + chap. 2, sections I + III]
Jan 29	the Aristotelian cosmos CR, 27-30 Aristotle, <u>Physics</u> , book II, selections D, 10-15 [chap. 1, section I]
Jan 31	the Greek cosmological tradition CR, 31-36 diagrams; Ptolemy, <u>Almagest</u> , bk. I, chaps. 2-4
Feb 5	the Greek astronomical tradition CR, 37-41 Ptolemy, <u>Almagest</u> , book I, chap. 7; planetary models
Feb 7	the renaissance in astronomy CR, 43 Peurbach, <u>New theoricis of the planets</u> (1475), illustration D, 15-24, 33-37 [chap. 1, sections II-III + chap. 2, section II]
Feb 12	heliocentrism CR, 45-57 Copernicus, <u>On the revolutions</u> (1543): 'To his holiness' + bk. I, intro + chap. 10; diagrams D, 33-37 [chap. 2, section II]
Feb 14	responses to heliocentrism CR, 45-46, 59 Copernicus, <u>On the revolutions</u> (1543), prefatory matter; Tycho Brahe material D, 41-45, 74-78, 101-104 [ch. 2, section IV; ch. 4, section III (Kepler); ch. 6, section I]
Feb 19	heliocentrism CR, 61-76 Kepler illustrations; Galileo, <u>Sidereal messenger</u> (1610) + diagrams D, 65-73 + 104-8 [ch. 4, sections I-III + ch. 6, section II]
Feb 21	the Galileo affair (I) CR, 77-84 timeline; Castelli-Galileo letters (1613) Council of Trent decrees
Feb 26	the Galileo affair (II) CR, 85-91 Bellarmine-Foscarini letter (1615); inquisition documents (1616) + Vatican letters (1631) Galileo, <u>Dialogue on the two chief world systems</u> (1632)
Feb 28 (Th)	Special Collections: introduction (meet in Memorial Library)
Mar 4 (Tu)	Special Collections: Sacrobosco (meet in Memorial Library) / Exam 1 due in class
Mar 6 (Th)	Special Collections: group project (meet in Memorial Library)

- Mar 11 (Tu) **science in print (I) : class presentations**
Mar 13 (Th) **science in print (I) : class presentations**
- March 18-20 **spring break**
- Mar 25 **the skeptical crisis**
CR, 109-112 Descartes, Discourse on the method (1637), selections
D, 80-84 [ch. 5, section I]
- Mar 27 **monsters and marvels**
CR, 131-143 Of two woonderful Popish monsters (1586), selections
Paré, On monsters and prodigies (1573), selections
- April 1 **the Baconian project**
CR, 144-154 Bacon, 'Preparative' (1620)
D, 57-64 [ch. 3, sections III-IV]
- April 3 **experimentation**
CR, 155-175 Galileo, Dialogue on the two world systems (1632)
Boyle, 'New experiments' (1668)
D, 131-45 [ch. 7, sections I-III]
- April 8 **mechanical philosophies**
CR, 113-114 Descartes, Principles of philosophy (1644/1647), #203-207
D, 84-86 [ch. 5, section II]
- April 10 **the Cartesian world**
CR, 115-120 Descartes, The world (1633/1677), ch. 5-7
D, 86-100 [ch. 5, sections III-VI] PT: 'Descartes'
- April 15 **the Newtonian world**
CR, 121-126 Newton, System of the world (1685), selections
Newton, Opticks (1706/1717), Query 31, selections
D, 149-63 [ch. 8, sections I-II, esp. section II]
- April 17 **Newtonianism**
CR, 127-130 Newton, 'General Scholium' (1713)
D, 163-67 [ch. 8, sections II-III]
- April 22 (Tu) Philosophical transactions online exercise / **Exam 2 due (my mailbox)**
CR, 93-108 Philosophical transactions 1 (1665): 1-16
- April 24 (Th) **science in print (II) : class presentations**
- April 29 (Tu) **science in print (II) : class presentations**
May 1 **scientific societies (I)**
CR, 179-191 Woodward, Brief instructions (1696)
D, 111-23 [chap. 6, section IV]
- May 6 **scientific societies (II)**
CR, 193-200 Cassini, 'Voyages to Cape Verde' (1684)
CR, 201-225 Tachard, A relation of the voyage to Siam (1688), selections
D, 111-30 [chap. 6, sections IV-V]
- May 8 **science and society**
CR, 227-252 Bacon, New Atlantis (1627), selections;
Swift, Gulliver's travels (1735), part 3, selections
- May 13 (Tu) **Exam 3 due by 2:00pm**

