

Dept files

History of Science 903
Seminar: The Life and Times of Galileo Galilei
Michael H. Shank
History of Science, UW-Madison, Spring 1999

Thursdays, 3:30-5:30 in Social Science 6125

Office Hours: W 2:30-3:30 and by appointment (mhshank@facstaff.wisc.edu; office phone: 262-3972; dept fax: 262-3984)

Books (paperbacks required)

Stillman Drake, trans., *Discoveries and Opinions of Galileo* (Anchor, 1957). 0-385-09239-3
Peter Machamer, ed., *The Cambridge Companion to Galileo* (Cambridge: Cambridge University Press, 1998) 0-521-58841-3
Stillman Drake, *Galileo at Work: His Scientific Biography* [1978] (New York: Dover, 1995) 0-486-28631-2
Galileo on the World Systems: A New Abridged Translation and Guide, trans and ed. by Maurice Finocchiaro (Berkeley: U. of California Press, 1997) 0-520-20646-0
Richard J. Blackwell, *Galileo, Bellarmine, and the Bible* (Notre Dame: University of Notre Dame Press, 1987). 0-268-01027-7
Maurice Finocchiaro, ed., *The Galileo Affair* (Berkeley: Univ. California Press, 1989). 0-520-06662-6.
Eileen Reeves, *Painting the Heavens: Art and Science in the Age of Galileo* (Princeton: Princeton University Press, 1997) 0-691-04398-1.

Recommended reading: one biography of Galileo of your choice (e.g.):

Ludovico Geymonat, *Galileo Galilei* (HSL)--philosophical
James Reston, Jr., *Galileo* (HarperCollins, 1994)--general reader
Michael Sharatt, *Galileo, Decisive Innovator* (Cambridge UP)--scholarly

Requirements

This is a reading and discussion seminar, which will function only if participants are well prepared; doing the assigned readings on time is therefore very important, as is participation by way of informed questions and comments.

Evaluation

- A) In-class contribution and participation in discussion (30%)
- B) Two in-class 15 min. reports/handout (10% each)
This is an exercise in teaching; clarity and intelligibility are at a premium.
- C) Writing (60%) ca. 25-30 pp. ; option of:
 - 1) three separate critical essay-reviews (8-10 pp. each) of substantive books on Galileo; suggested schedule: one due before break; one right after break; one at the end.
 - 2) one substantive literature review on a given topic (to include books and articles)
 - 3) one research paper based on primary sources and on a question to be discussed

I expect scrupulous honesty, esp. in written work. Treat your evidence and your opponents fairly. Use quotation marks to distinguish the words of others from your own. Give credit to the sources of your ideas. If you are unsure about proper citation practice, look at Wayne Booth *et al.*, *The Craft of Research* (Chicago, 1995) and the *Chicago Manual of Style*. If questions remain, contact me (in person, by phone, or by email).

Useful references that are easy to overlook: note the chronology in *The Galileo Affair* (297-312) and the helpful casts of characters in *ibid* (313-324) and *Galileo at Work*, 437-471.

There is a useful Galileo website at Rice University: <http://es.rice.edu/ES/humsoc/Galileo/>

HSL (below) = History of Science Library, Social Science 7130. Galileo books will be on a separate HS 903 shelf; journals will not.

Proposed Schedule

Week 1 (January 21): Introduction to Course/Sixteenth-Century Background

Readings: *Galileo on the World Systems*, pp. 1-38.

Introduction(s), syllabus, background, preliminary report assignments

Recommended for general background (HSL): Thomas Kuhn, *The Copernican Revolution*, ch. 1-4; [HSL] I. Bernard Cohen, *The Birth of a New Physics* [HSL]; James Lattis, *Between Copernicus and Galileo: Christoph Clavius and the Collapse of Ptolemaic Cosmology* (Chicago: University of Chicago Press, 1994); Stillman Drake, *Galileo Galilei* (Oxford/Hill and Wang); Ludovico Geymonat, *Galileo Galilei: A Biography and Inquiry into his Philosophy of Science*; Alexandre Koyré, "Galileo and Plato" from his *Metaphysics and Measurement* [HSL]

Week 2 (28 January): The Early Galileo and his Context

Readings: S. Drake, "Vincenzio Galilei and Galileo," *Galileo Studies*, pp. 43-62 (HSL); Blackwell, *Galileo, Bellarmine*, ch. 1, Appendices 1-3, pp. 5-27, 181-194; Drake, *Galileo at Work*, ch. 1-2, pp. 1-32; William A. Wallace, "Galileo's Pisan Studies in Science and Philosophy," in *Companion*, 27-52.

Possible reports: Vincenzio Galilei and music, using the work of Claude Palisca and translations of V. Galilei's works; Charles Schmitt on Galileo's Pisan Years (see his *Variorum* reprint volumes); Galileo's *De motu* in relation to the Pisan and early Paduan contexts.

Week 3 (4 February): Mechanics in the early Galileo and his predecessors

Lindberg, *Beginnings of Western Science*, pp. 290-307; Drake, *Galileo at Work*, ch. 3-7, pp. 33-133; Reeves, *Painting the Heavens*, ch. 1-3 (pp. 1-137); Wallace Hooper, "Inertial Problems in Galileo's Pre-inertial Framework," in *Companion*, 146-174.

Possible reports: William Wallace's work (esp *Galileo and his Sources*), the Wallace-Crombie scuffle etc.; Galileo as a 'mechanic' or instrument-maker.

Week 4 (11 February): Galileo's *Starry Messenger* (1610)

Readings: Skim the intro to *Discoveries and Opinions* (1-19) and read "Starry Messenger" (1610), pp. 23-58; Westfall, "Scientific Patronage: Galileo and the Telescope," *Isis* 76 (1985) 11-30 [HSL]; Biagioli, "Galileo the Emblem-maker," *Isis* 81 (1990) 230-258 [HSL]; Drake, *Galileo at Work*, ch. 8-9, pp. 134-176; Reeves, ch. 4, pp. 138-183; Noel Swerdlow, "Galileo's Discoveries with the Telescope," in *Companion*, 244-270.

Recommended: Mary Wickler and Albert Van Helden, "Representing the Heavens: Galileo and Visual Astronomy," *Isis* 83 (1992) 195-217 [HSL]

Possible report: Mario Biagioli, *Galileo, Courtier*, and the ensuing controversy: Shank, "Galileo's Day in Court," *Journal for the History of Astronomy* 25 (1994) 236-242; Biagioli, "Playing with the Evidence," and Shank, "How Shall We Practice History? The Case of Biagioli's *Galileo, Courtier*," *Early Science and Medicine* 1 (1996) 69-150; other reviews by Shapin, Golinski, Wallace, Shea, Pitt.

Week 5 (18 February): Galilean Controversies, 1610-1613

Readings: "Letters on Sunspots" (1613) in *Discoveries and Opinions*, pp. 89-144 (skim the intro, pp. 59-85); "Letter to Castelli" (1613), in Blackwell, pp. 195-201; Drake, *Galileo at Work*, ch. 10-12, pp. 177-230; Reeves, ch. 5, pp. 184-225.

Possible report: "Dispute over Bodies in Water," (See Drake, "Dispute over Bodies in Water," *Galileo Studies*, 159-176); Drake, *Cause, Experiment and Science*: only introduction and red print (=Galileo's "Bodies that Stay atop Water or Move in it") are required (the "dialogue" itself was composed not by Galileo, but by Drake!).

Week 6 (25 February): Natural Philosophy and Religious Knowledge

Read "Letter to Grandduchess Christina" in Finocchiaro, *Galileo Affair*, pp. 87-118 [not in *Discoveries and Opinions* (145-216)--Drake's translation is not as good]; Blackwell, ch. 2-3, pp. 53-110; Drake, *Galileo at Work*, ch. 13, pp. 231-251; Ernan McMullin, "Galileo on Science and Scripture," in *Companion*, 271-347.

Possible report: different approaches to the "Letter to the Grandduchess" (Santillana, Langford, Blackwell, Westfall, etc)

Week 7 (4 March): Galileo admonished

Readings: *Galileo on the World Systems*, pp. 38-43; Finocchiaro, *The Galileo Affair*, pp. 119-124, 131-153 (incl. Discourse on tides); Blackwell, chap. 4-5, pp. 87-134, and Appendices 5-9A, pp. 203-273 (includes Foscarini's Letter); Drake, *Galileo at Work*, ch. 14, pp. 252-288; Marcello Pera, "The God of Theologians and the God of Astronomers: An Apology of Bellarmine," in *Companion*, 367-87.

Possible reports: Bellarmine's Louvain Lectures, ed. U. Baldini and G. V. Coyne (*Studi Galileani*, vol. 1, #2, Vatican City, 1984); different approaches to the Admonition (Santillana vs. Drake in appendix to Geymonat; books by Redondi; Fantoli; Feldhay; etc)

Spring Break 6 March-14 March

Week 8 (18 March): Galileo the Philosopher?

Readings: Galileo, *The Assayer* (*Discoveries and Opinions*, 217-281); Galileo, "Reply to Ingoli" (Finocchiaro, *The Galileo Affair*, 154-197); plus the anonymous complaint (ibid., 202-204); Drake, *Galileo at Work*, ch. 15, pp. 267-289.

Possible report: The Redondi thesis (*Galileo, Heretic*, including reviews) and Westfall's response (in his *Essays on the Trial of Galileo*).

Week 9 (25 March): Galileo's *Dialogue* (1632) I

Readings: *Galileo on World Systems*, "To the Discerning Reader," and Day One, pp. 77-116 including the explanatory notes; Drake, *Galileo at Work*, ch. 16-17, pp. 289-329.

Possible report: Methodological and philosophical takes on Galileo: the Platonist (Koyré, "Galileo and Plato" from his *Metaphysics and Measurement*), or the anarchist (Paul Feyerabend's *Against Method* with responses by Peter Machamer and Alan Chalmers), or the empiricist (S. Drake), or the smart Aristotelian (William Wallace); etc.

Week 10 (1 April): Galileo's *Dialogue* (1632) II

Readings: *Galileo on World Systems*, Day Two, pp. 117-220 including the explanatory notes; Drake, *Galileo at Work*, ch. 18, pp. 330-352.

Week 11 (8 April): Galileo's *Dialogue* (1632) III

Readings: *Galileo on World Systems*, Days Three and Four, pp. 221-308 including the explanatory notes. Drake, *Galileo at Work*, ch. 19, pp. 353-372; Pietro Redondi, "From Galileo to Augustine," in *Companion*, 175-210.

Week 12 (15 April): Galileo in Trouble

Readings: Trial documents in Finocchiaro, ed., *The Galileo Affair*, pp. 198-255; William Shea, "Galileo's Copernicanism: The Science and the Rhetoric," in *Companion*, 211-243.

Possible report: Historiography of the trial –many sources and interpretations (much literature reviewed in Fantoli)

Week 13 (22 April): Galileo and the Roman Inquisition

Readings: Finocchiaro, ed., *The Galileo Affair*, pp. 256-293; Blackwell, *Galileo, Bellarmine*, ch. 6-7, pp. 135-179; D. P. Walker, *Spiritual and Demonic Magic from Ficino to Campanella* (Notre Dame, 1958. 1969), pp. 203-212.

Possible report: ditto

Week 14 (29 April): Galileo's mature mechanics I

Galileo Galilei, *Two New Sciences* (Drake transl.), Day 3 (pp. 153-170) and Day 4 (217-229); Drake, *Galileo at Work*, ch. 20-22, pp. 373-436.

Possible report: Historiography of Galileo's mechanics (including Drake, Wisan, Naylor, etc)

Week 15 (6 May): Galileo's mature mechanics II/Epilogue

Ken'ichi Takahashi, "Galileo's Labyrinth: His Struggle for Finding a Way out of his Erroneous Law of Natural Fall," *Historia Scientiarum* 2(1993) 169-202; 3(1992) 1-34.

Among the many suitable for reports and reviews:

Galileo, *De motu* (HSL)

Drake, *Galileo at Work*

Geymonat, *Galileo Galilei* (HSL)

William Wallace, *Galileo's Early Notebooks* (Notre Dame) (HSL)

William Wallace, *Galileo and His Sources* (Princeton)

Alexandre Koyré, *Galilean Studies*

William Shea, *Galileo's Intellectual Revolution*

Joseph Pitt, *Galileo, Human Knowledge, and the Book of Nature* (philosophy of science orientation)

Paul Feyerabend, *Against Method* (iconoclastic philosophy of science orientation)

Michael Segrè, *In the Wake of Galileo* (Italy after Galileo)

Giorgio de Santillana, *The Crime of Galileo* (classic, anticlerical approach)

C. B. Schmitt, *Variorum* Reprint of his Galilean materials (Pisa etc)

Ludovico Geymonat, *Galileo Galilei* (HSL)—philosophical biography

James Reston, Jr., *Galileo* (HarperCollins, 1994)—for the general reader

Michael Sharatt, *Galileo, Decisive Innovator* (Cambridge UP)—scholarly biography

Jean Dietz Moss, *Novelties in the Heavens* (rhetorical analysis)

Annibale Fantoli, *Galileo for Copernicanism and the Church* (comprehensive)

Rivka Feldhay, *Galileo and the Church: Political Inquisition or Critical Dialogue?* (Jesuits vs. Dominicans)

In Italian:

Favaro on Galileo and Padua;

L. Olschki biography of Galileo

On Galileo's first brush with the Inquisition

Possible reports:

HSL=History of Science Dept Library

Background

James Lattis, *Between Copernicus and Galileo: Christoph Clavius and the Collapse of Ptolemaic Cosmology* (Chicago: University of Chicago Press, 1994)

Vincenzo Galilei as a theoretician of music (Palisca, primary sources)

The Early Galileo

Galileo, *De motu* (HSL)

William Wallace, *Galileo's Early Notebooks* (Notre Dame) (HSL)

William Wallace, *Galileo and His Sources* (Princeton)

more Wallace

Mechanics

Alexandre Koyré, *Galilean Studies*

William Shea, *Galileo's Intellectual Revolution*

Joseph Pitt, *Galileo, Human Knowledge, and the Book of Nature*

Paul Feyerabend, *Against Method*

Peter Machamer,

C. B. Schmitt, *Variorum* Reprint of his Galilean materials (Pisa etc)

The Years after the Telescope

Mario Biagioli, *Galileo, Courtier*

Jean Dietz Moss, *Novelties in the Heavens*

Galileo and the Church

Giorgio de Santillana, *The Crime of Galileo* (HSL)

Annibale Fantoli, *Galileo for Copernicanism and the Church*

Rivka Feldhay, *Galileo and the Church: Political Inquisition or Critical Dialogue?*

Aftermath

Michael Segrè, *In the Wake of Galileo*

In Italian:

Favaro on Galileo e lo Studio di Padova; L. Olschki biography of Galileo