

## Science in the Cold War Syllabus

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**Office Hours: Tuesdays 2-4, Science Center 462 (and by appointment)**

### Course Description

The Cold War was an era of unprecedented growth in the sciences—and unprecedented political stakes for scientific research. This course will cover the history of the physical, biological, and human sciences on both sides of the Berlin Wall, and will pay particular attention to intersections between science, politics, and governments. Topics will include the Manhattan Project, the development of “big science,” genetics and Lysenkoism, the nuclear arms race and the space race, scientific espionage, and communication between scientists in the West and in the Soviet world.

### Required Books (available at the Harvard Coop)

- Audra J. Wolfe, *Competing with the Soviets: Science, Technology, and the State in Cold War America* (Baltimore: Johns Hopkins University Press, 2012). -- \$20
- Spencer Weart, *The Rise of Nuclear Fear* (Cambridge: Harvard University Press, 2012). - \$22

All other reading will be available as PDF downloads on the course iSite (available through my.harvard.edu, login required) or through Harvard's library resources (links on the course iSite).

### Schedule of Lectures and Readings

#### Week 1: Introduction

September 3: Introduction/Course Expectations  
Sep. 5: Prelude 1 – The Lysenko Affair

#### *Reading:*

- Wolfe, “Introduction”
- Loren Graham, *Science in Russia and the Soviet Union* (1994), chapter 6: “Stalinist Ideology and the Lysenko Affair,” pp. 121-134
- Trofim Lysenko, *The Science of Biology Today* (New York: International Publishers, 1948), 9-19, 28-34, 43-48. [PRIMARY SOURCE]

#### Week 2: Science in war and postwar

Sep. 10: Prelude 2 – The Manhattan Project  
Sep. 12: The promise and perils of postwar science

#### *Reading:*

- Wolfe, Chapter 2: “The Military-Industrial Complex”
- Weart, Chapter 6: “The News from Hiroshima,” pp. 55-70

- Detlev W. Bronk, “The National Science Foundation: Origins, Hopes, and Aspirations.” *Science* 188 (2 May 1975): 409-414.
- Daniel J. Kevles, “The National Science Foundation and the Debate over Postwar Research Policy, 1942-1945: A Political Interpretation of *Science - The Endless Frontier*.” *Isis* 68 (1977): 5-26.
- Vannevar Bush, *Science: The Endless Frontier* (1945), pp. 1-40 [PRIMARY SOURCE]

Week 3: The Soviet bomb project and the beginnings of the arms race

Sep. 17: Potsdam, the Smyth Report, and First Lightning

Sep. 19: Building bigger and bigger bombs

*Reading:*

- Wolfe, Chapter 1, “The Atomic Age”
- Weart, Chapter 7, “National Defenses”
- Gennady Gorelik, “The Paternity of the H-Bombs: Soviet-American Perspectives” *Physics in Perspective* 11 (2009): 169-197.
- Alex Wellerstein, “Los Alamos and the Smyth Report,” *Restricted Data: The Nuclear Secrecy Blog* (15 August 2012): <http://nuclearsecrecy.com/blog/2012/08/15/los-alamos-and-the-smyth-report/>
- Selections from Henry DeWolf Smyth, *Atomic Energy for Military Purposes* (1945). Full report available online at <http://www.atomicarchive.com/Docs/SmythReport/>. Read Chapter 2, “The Statement of the Problem”; Chapter 12, “The Work on the Atomic Bomb”; Chapter 13, “General Summary.” [PRIMARY SOURCE]

Week 4: Physics, “big science,” and molecular biology

Sep. 24: Expanding scales for physics

**Blog Entry 1 is due at the beginning of lecture**

Sep. 26: Physics takes over biology – or does it?

*Reading:*

- Wolfe, Chapter 3, “Big Science”
- Peter Galison, Bruce Hevly, and Rebecca Lowen, “Controlling the Monster: Stanford and the Growth of Physics Research, 1935-1962,” in Peter Galison and Bruce Hevly, eds., *Big Science: The Growth of Large-Scale Research* (Stanford University Press, 1992), 46-77.
- Dominique Pestre and John Krige, “Some Thoughts on the Early History of CERN,” in Galison and Hevly, eds., *Big Science*, 78-99.
- Michel Morange, *A History of Molecular Biology*, trans. Matthew Cobb (Harvard University Press, 1998): Chapter 7, “The Role of the Physicists,” pp. 67-78
- Excerpts from *The Double Helix* [PRIMARY SOURCE]

Week 5: Praise and suspicion for scientists

October 1: The case of Robert Oppenheimer

Oct. 3: Creating a scientific workforce

*Reading*

- David Kaiser, “The Atomic Secret in Red Hands? American Suspicions of Theoretical Physicists during the Early Cold War,” *Representations* 90 (2005): 28-60.
- Daniel Kevles, “Cold War and Hot Physics: Science, Security, and the American State, 1945-1956,” *Historical Studies in the Physical and Biological Sciences* 20 (1990): 239-264.
- Kai Bird and Martin Sherman, *American Prometheus: The Triumph and Tragedy of J. Robert Oppenheimer* (Alfred A. Knopf 2005), pp. 195-201, 538-550.

Week 6: Soviet Biology and scientific espionage

Oct. 8: Soviet Biology under Stalin and Khrushchev

Oct. 10: How to steal scientific secrets

*Reading:*

- Nikolai Kremontsov, “In the Shadow of the Bomb: US-Soviet Biomedical Relations in the Early Cold War, 1944-1948,” *Journal of Cold War Studies* 9 (2007): 41-67.
- Konstantin Ivanov, “Science after Stalin: Forging a New Image of Soviet Science,” *Science in Context* 15 (2002): 317-338.
- Kristie Macrakis, “Technophilic Hubris and Espionage Styles during the Cold War,” *Isis* 101 (2010): 378-385.
- Michael Gordin, *Red Cloud at Dawn: Truman, Stalin, and the End of the Atomic Monopoly*, Chapter 3: “Larger than Enormoz,” 106-132.

Week 7: Space race

**Oct. 15: MIDTERM!**

Oct. 17: Sputnik and Apollo

*Reading:*

- Wolfe, Chapter 6: “The Race to the Moon”
- Walter McDougall, *The Heavens and the Earth: A Political History of the Space Age* (2008), Chapter 14: “Space Age Communism: The Khrushchevian Synthesis,” pp. 276-293.
- Selections from Homer Hickham, *Rocket Boys: A Memoir*
- John F. Kennedy, Address at Rice University (1962). Available at <http://er.jsc.nasa.gov/seh/ricetalk.htm> [PRIMARY SOURCE]

Week 8: A changing view of the Cold War

Oct. 22: Cold War science between the superpowers

Oct. 24: Competing for the unaligned world

**Blog entry 2 is due today**

*Reading:*

- Wolfe, Chapter 4, “Hearts and Minds and Markers”
- John Krige, “Atoms for Peace, Scientific Internationalism, and Scientific Intelligence,” *Osiris* 21 (2006): 161-181.
- Itty Abraham, *The Making of the Indian Atomic Bomb* (1999), Chapter 4, “Learning to Love the Bomb: The ‘Peaceful’ Nuclear Explosion of 1974,” pp. 113-150.

- E.B. Worthington, “Organization of Research in Africa,” *The Scientific Monthly* 74 (January 1952): 39-44. [PRIMARY SOURCE]
- Louis Berlinguet, “Science and Technology for Development,” *Science* 213 (4 September 1981): 1073-1076. [PRIMARY SOURCE]

Week 9: Nuclear fear and Cold War social sciences

Oct. 29: Just how bad would nuclear war be, anyway?

Oct. 31: Cold War social science

**Your research paper topic proposal is due today.**

*Reading:*

- Weart, Chapter 12: “The Imagination of Survival”
- Rebecca Lemov, “‘Hypothetical Machines’: The Science-Fiction Dreams of Cold War Social Science,” *Isis* 101 (2010): 401-411.
- Paul Erickson, “Mathematical Models, Rational Choice, and the Search for Cold War Culture,” *Isis* 101 (2010): 386-392.
- Herman Kahn, *On Thermonuclear War* (Princeton University Press 1961, 2<sup>nd</sup> Edition), pp. 40-95. [PRIMARY SOURCE] – **Concentrate on pages 40-62 and 74-95.**
- Raymond Bradbury, “There Will Come Soft Rains” [PRIMARY SOURCE]

Week 10: Journals and geology

November 5: Communication across the Iron Curtain

Nov. 7: Cold war geophysics and the development of plate tectonics

*Reading:*

- Jacob D. Hamblin, “Science in isolation: American marine geophysics research, 1950-1968,” *Physics in Perspective* 2 (2000): 293-312.
- Naomi Oreskes, “A Context of Motivation: US Navy Oceanographic Research and the Discovery of Sea-Floor Hydrothermal Vents,” *Social Studies of Science* 33 (2003): 697-742.
- A.I. Alichanian & A.I. Alichanow, and C.F. Powell, “Concerning New Elementary Particles in Cosmic Rays,” *Nature* 163 (14 May 1949): 761-2. [PRIMARY SOURCE]
- Vera Rich, “USSR,” *Nature* 261 (20 May 1976): 185. [PRIMARY SOURCE]
- Vera Rich, “Russian plate tectonics: Drift of Change,” *Nature* 286 (14 August 1980): 652. [PRIMARY SOURCE]

Week 11: Activism and Computing

Nov. 12: 60s radicalism and Cold War science

Nov. 14: Cold War computers

*Reading:*

- Wolfe, Chapter 7: “The End of Consensus”
- Paul Edwards, *The Closed World*: Chapter 9: “Computers and Politics in Cold War II,” pp. 275-302.
- Jennifer Light, “When computers were women,” *Technology and Culture* 40 (1999), 455-

483.

- Rachel Carson, *Silent Spring* (Fawcett Publications 1962), pp. 13-43. [PRIMARY SOURCE]

Week 12: The 1970s in the US and USSR

Nov. 19: Soviet science after Khrushchev

Nov. 21: Physics on the decline, biology on the rise?

*Reading:*

- Wolfe, Chapter 8, “Cold War Redux”
- Loren R. Graham, “Big Science in the Last Years of the Big Soviet Union,” *Osiris* (1992): 49-71.
- Zhores Medvedev, *Soviet Science* (W.W. Norton & Co. 1978), Chapter 8, “*Détente* and Soviet Science (1972-1977),” pp. 137-203. [PRIMARY SOURCE]

Week 13: Chernobyl, Cold Fusion, and nuclear power at the end of the Cold War

Nov. 26: Nuclear power in the 1980s

**Your research paper is due today.**

**No Class on Thursday Nov. 28 – Thanksgiving Break. No section this week.**

*Reading:*

- Weart, *Nuclear Fear*, Chapter 15: “Reactor Poisons and Promises,” pp. 172-181, and Chapter 21, “The Second Nuclear Age,” pp. 242-256.
- TIME Magazine, “Fusion Illusion” [PRIMARY SOURCE]

Week 14: Wrap-up

December 3: The legacies of the Cold War

**No Class on Thursday Dec. 5 – Reading period. Section this week will be replaced with final exam study sessions (times and places TBD).**

*Reading:*

- Daniel Kevles, “The Crisis of Contemporary Science: The Changed Partnership,” *Woodrow Wilson Quarterly* 19 (Summer 1995): 41-52.

**Your final examination will take place during the exam period.**

**Good luck and enjoy the break!**