

Field IV: PHYSICAL SYSTEMS

Field Description

Rather than treat the physical sciences as autonomous domains, this field emphasizes the interconnectedness of astronomy, physics, chemistry, and related disciplines as systems designed for analysis, experiment, and intervention in the inorganic world.

Philosophical, historical and social science approaches are applied to show how matter, energy, ideas, communicative strategies and technological processes have converged to create physical systems and the disciplines that probe them.

The Core Reading List (for all students)

Alder, Ken. 2010. *Engineering the Revolution: Arms and Enlightenment in France, 1763-1815*. Chicago: University of Chicago.

Galison, Peter. 1987. *How Experiments End*. Chicago: University of Chicago.

Galison, Peter. 2000. *Image and Logic: A Material Culture of Microphysics*. Chicago: University of Chicago.

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Hacking, Ian. 1983. *Representing and Intervening: Introductory Topics in the Philosophy of Natural Science*. Cambridge: Cambridge University.

Hughes, Thomas P. 1993. *Networks of Power Electrification in Western Society, 1880-1930*. Baltimore: Johns Hopkins University.

Keller, Evelyn F. 1995. *Refiguring life: Metaphors of Twentieth-Century Biology*. New York: Columbia University.

Latour, Bruno. 1987. *Science in Action: How to Follow Scientists and Engineers Through Society*. Cambridge: Harvard University.

Mackenzie, Donald A. 1990. *Inventing Accuracy: A Historical Sociology of Nuclear Missile Guidance*. Cambridge: MIT.

Oreskes, Naomi. 1999. *The Rejection of Continental Drift Theory and Method in American Earth Science*. Oxford: Oxford University Press.

Pickering, Andrew. 1984. *Constructing Quarks: A Sociological History of Particle Physics*. Chicago: University of Chicago.

Rudwick, Martin J. S. 1985. *The Great Devonian Controversy: The Shaping of Scientific Knowledge Among Gentlemanly Specialists*. Chicago: University of Chicago.

Sasaki, Chikara, Mitsuo Sigiura, and Joseph Warren Dauben. 1994. *The Intersection of*

History and Mathematics. Science Networks Historical Studies, 15. Basel: Birkhauser-Verla.

Shapin, Steven, Simon Schaffer, and Thomas Hobbes. 1985. *Leviathan and the air-pump: Hobbes, Boyle, and the experimental life*. Including a translation of *Thomas Hobbes, Dialogus physicus de natura aeris* by Simon Schaffer. Princeton: Princeton University.

Traweek, Sharon. 1988. *Beamtimes and Lifetimes: The World of High Energy Physicists*. Cambridge: Harvard University.

The Recommended Reading List

Aaserud, Finn. 1990. *Redirecting Science: Niels Bohr, Philanthropy, and The Rise of Nuclear Physics*. Cambridge: Cambridge University.

Alder, Ken. 2002. *The Measure of All Things: The Seven-Year Odyssey and Hidden Error That Transformed the World*. New York: Free Press.

Beyerchen, Alan. 1977. *Scientists Under Hitler: Politics and the Physics Community in the Third Reich*. New Haven: Yale University.

Buchwald, Jed Z. 1985. *From Maxwell to Microphysics: Aspects of Electromagnetic Theory in the Last Quarter of the Nineteenth Century*. Chicago: University of Chicago.

Cahan, David. 1989. *An Institute for an Empire: The Physikalisch-Technische Reichsanstalt, 1871-1918*. Cambridge: Cambridge University.

Cassidy, David C. 1992. *Uncertainty: The Life and Science of Werner Heisenberg*. New York: W.H. Freeman.

Chang, Hasok, and Catherine Jackson, eds. 2007. *An Element of Controversy: The Life of Chlorine in Science, Medicine, Technology and War*. BSHS Monographs, no. 13. Fleet, Hampshire: British Society for the History of Science.

Daston, Lorraine, and Peter Galison. 2007. *Objectivity*. New York: Zone Books.

Daston, Lorraine. 1986. "The Physicalist Tradition in Early Nineteenth-Century French Geometry." *Studies in History and Philosophy of Science* 17: 269-95.

Davis, Philip J., and Reuben Hersh. 1986. *Descartes' Dream: The World According to Mathematics*. San Diego: Harcourt Brace Jovanovich.

Dettelbach, Michael. 1999. "The Face of Nature: Precise Measurement, Mapping, and Sensibility in the Work of Alexander von Humboldt." *Studies in History and Philosophy of Biological and Biomedical Sciences* 30C (4) :473-504.

Edwards, Paul N. 2010. *A Vast Machine: Computer Models, Climate Data, and the Politics of Global Warming*. Cambridge: MIT Press.

Evans, James. 1998. *The History and Practice of Ancient Astronomy*. New York: Oxford

University.

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- Johnson, Allan. 1990. *The Kaiser's Chemists: Science and Modernization in Imperial Germany*. Chapel Hill: University of North Carolina.
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- Merchant, Carolyn. 1980. *The Death of Nature: Women, Ecology, and the Scientific Revolution*. New York: Harper and Row.
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- Nye, David. 1994. *American Technological Sublime*. Cambridge: MIT.
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