

PHIL 93889/HPS93820
Einstein's Philosophy of Science
MW 2:00-3:15
220 Malloy

Fall 2016

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Office Hours: TTh 2:00-3:00

Texts: All readings will be available electronically. In those cases where copyright restrictions apply to material not directly available via Hesburgh Libraries, copies will be made available through the Sakai site for the course.

Requirements: Each student will be required to do one presentation to the class, on a topic to be chosen in consultation with the instructor. The presentation will be worth 40% of the final course grade. 10% of the final course grade will be based on class participation. A term paper (minimum fifteen pages) worth 50% of the course grade will complete the requirements for the course, the term paper topic also to be chosen in consultation with the instructor.

Schedule:

Date:	Topic:	Readings:
24 Aug.	Introduction—Einstein as a Philosopher of Science	Howard, "Albert Einstein as a Philosopher of Science," <i>Physics Today</i> 48 Dec 2012: 34-40.
29 Aug.	Physics and Philosophy of Science at the Turn of the Twentieth Century	Howard, "Physics and the Philosophy of Science at the Turn of the Twentieth Century," in <i>Storia della scienza</i> . Vol. 8, <i>La Seconda rivoluzione scientifica</i> . Umberto Bottazzini, John L. Heilbron, Gilberto Corbellini, and Daniel J. Kevles, eds. Rome: Istituto della Enciclopedia Italiana, 2004, pp. 3-16.
31 Aug.	Einstein's Early Philosophical Training	
5 Sep.	Einstein and the Special Theory of Relativity	Einstein, <i>Relativity: The Special and General Theory</i> , pp. 1-68.
7 Sep.		
12 Sep.	Ernst Mach's "Biologico-Economical" and "Historical-Critical" Projects	Ernst Mach, "The Guiding Principles of My Scientific Theory of Knowledge and Its Reception by My Contemporaries"; "Newton's Views on Time, Space, and Motion," <i>The Science of Mechanics</i> .
14 Sep.	Conventionalism: Henri Poincaré	Henri Poincaré, "Non-Euclidean Geometries," "Space and Geometry," "Experiment and Geometry," and "Hypotheses in Physics," from <i>Science and</i>

		<i>Hypothesis.</i>
19 Sep.	Conventionalism: Pierre Duhem	Pierre Duhem, "Physical Theory and Metaphysical Explanation," "Abstract Theories and Mechanical Models," and "Physical Theory and Experiment," from <i>The Aim and Structure of Physical Theory</i> .
21 Sep.	Einstein, Mach, and Duhem	Gerald Holton, "Einstein, Mach, and the Search for Reality." Philipp Frank.
26 Sep.		"Einstein's Philosophy of Science." <i>Reviews of Modern Physics</i> 21 (1949), 349-355.
28 Sep.		Howard, "Einstein and Duhem"; Howard, "Was Einstein Really a Realist?"
3 Oct.	Einstein and the General Theory of Relativity	Einstein, <i>Relativity: The Special and General Theory</i> , pp. 69-137.
5 Oct.		
10 Oct.	Einstein and Schlick	Mortiz Schlick, "The Philosophical Significance of the Theory of Relativity"; "Relations to Philosophy," In <i>Space and Time in Contemporary Physics</i> .
12 Oct.	Einstein, Kant, and the Origins of Logical Empiricism	Albert Einstein, "Geometry and Experience." Moritz Schlick, "Critical or Empiricist Interpretation of the New Physics," <i>Kant-Studien</i> 26 (1921), 96-111.
17-21 Oct.	Fall Break	
24 Oct.	Einstein, Kant, and the Origins of Logical Empiricism (continued)	Howard, "Einstein, Kant, and the Origins of General Relativity," in <i>Language, Logic, and the Structure of Scientific Theories</i> . Wesley Salmon and Gereon Wolters, eds. Pittsburgh: University of Pittsburgh Press, 1994, pp. 45-105.
26 Oct.	Einstein and <i>Eindeutigkeit</i>	Howard, "Einstein and <i>Eindeutigkeit</i> : A Neglected Theme in the Philosophical Background to General Relativity." In <i>Studies in the History of General Relativity</i> . Jean Eisenstaedt and A. J. Kox, eds. Boston: Birkhäuser, 1992, pp. 154-243.

31 Oct.	Einstein and the Quantum Theory	John Stachel, "Einstein and the Quantum"
2 Nov.		
7 Nov.	Einstein's Critique of the Quantum Theory	Howard, "Einstein on Locality and Separability," <i>Studies in History and Philosophy of Science</i> 16 (1985), 171-201.
9 Nov.		Howard, "'Nicht sein kann was nicht sein darf,' or the Prehistory of EPR, 1909-1935: Einstein's Early Worries about the Quantum Mechanics of Composite Systems,," in <i>Sixty-Two Years of Uncertainty: Historical, Philosophical, and Physical Inquiries into the Foundations of Quantum Mechanics</i> . Arthur Miller, ed. New York: Plenum, 1990, pp. 61-111.
14 Nov.		"A Peek behind the Veil of Maya: Einstein, Schopenhauer, and the Historical Background of the Conception of Space as a Ground for the Individuation of Physical Systems." in <i>The Cosmos of Science: Essays of Exploration</i> . John Earman and John D. Norton, eds. Pittsburgh: University of Pittsburgh Press, 1997, pp. 87-150.
16 Nov.		[Student Presentation]
21 Nov.		[Student Presentation]
23 Nov.	<i>Thanksgiving Holiday</i>	
28 Nov.		[Student Presentation]
30 Nov.		[Student Presentation]
5 Dec.		[Student Presentation]
7 Dec.		[Student Presentation]
16 Dec.	<i>Term Papers Due</i>	