

BRANDON FOGEL

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EDUCATION

- Ph.D. History and Philosophy of Science, University of Notre Dame, Notre Dame, IN. May 2008.
Thesis: *Epistemology of a theory of everything: Weyl, Einstein, and the unification of physics*.
Advisor: Don Howard.
- M.S. Physics, University of Notre Dame, Notre Dame, IN. December 2005.
- M.A. History and Philosophy of Science, University of Notre Dame, Notre Dame, IN. May 2004.
- B.S. Physics, University of Pennsylvania, Philadelphia, PA, *summa cum laude*. May 1996.
- B.A. English, University of Pennsylvania, Philadelphia, PA, *summa cum laude*. May 1996.
Thesis: *The Making of One*.

AREAS OF SPECIALIZATION

Philosophy of physics; philosophy of science

AREAS OF COMPETENCE

Logic; metaphysics; history of philosophy

Philosophy of biology; history of science (physics and biology, in particular)

PUBLICATIONS

- Formalizing the separability condition in Bell's theorem, *Studies in History and Philosophy of Modern Physics*, 38 (2007): 920-937.
- *Creating a Physical Biology: The Three-Man Paper and the Origins of Molecular Biology*, University of Chicago Press, projected 2009. Editor (with P. Sloan).
- Translation of "Über die Natur der Genmutation und der Genstruktur" by N. Timoféeff-Ressovsky, K. Zimmer, and M. Delbrück, *Akademie der Wissenschaften, Göttingen: Mathematische-physikalische Klasse, Nachrichten aus der Biologie*, vol. 1 (1934–35), p. 190–245. To appear in *Creating a Physical Biology*.

DISSERTATION

Title: *Epistemology of a theory of everything: Weyl, Einstein, and the unification of physics.*

Abstract: In this dissertation, I examine the debate between Hermann Weyl and Albert Einstein over Weyl's 1918 unified field theory, both for its own merit and for the epistemological implications it holds for the ultimate goal of physics: a theory of everything. I provide a detailed explication of Weyl's response to Einstein's objection, including a careful exegesis of Weyl's somewhat enigmatic distinction between the determination of physical quantities through persistence versus adjustment. I show that Einstein's concerns were ultimately more methodological in nature than has been previously argued in the literature, thereby providing a novel explanation for the apparent inconsistency he evinces in the well-known 1921 lecture, "Geometry and Experience." Seen in this light, the differences between Einstein and Weyl in this period appear rather small, especially regarding one of the central themes of the dispute: how to make a physical theory testable. They both argue that, in a fully-developed theory, the behavior of measuring devices should not be taken as given but rather derived from first principles; i.e., as composite objects able to determine the properties of more basic entities, rigid rulers and regular clocks should arise as particular solutions of the fundamental equations. I argue that this requirement, though important for explaining how theories can make claims about the world that are capable of test through observation, leaves the task half-finished. Equally important is the task of showing why those measuring devices should be considered observable in the first place. I conclude that if we demand that this also be done without arbitrary stipulation, then we will need a detailed, scientific account of the sense-organs we use to make observations, constructed on the basis of the first principles of the theory we wish to test.

TALKS AND PRESENTATIONS

CHSS/Fishbein Workshop, "The Road Not Taken: Bell's Theorem and the Reality of Counterfactuals", Fishbein Center, University of Chicago, January 2009.

15th UK and European Meeting on the Foundations of Physics, "Epistemology of a theory of everything: Weyl, Einstein and the unification of physics", University of Leeds, March 2007.

Philosophy of Science Association: Twentieth Biennial Meeting, "Structure of holism", Vancouver, Canada, November 2006.

Sixth Congress of HOPOS, the International Society for the History of Philosophy of Science, Paris, France, "Ego-Eradication Program: Finding Hilbert in Weyl", June 2006.

Foundations of Physics Group, invited speaker, University of Maryland, "Structure of holism: What it takes for probability distributions to be separable and to factorize", October 2005.

4th International Summer School in Philosophy, Probability and Physics, University of Konstanz, Germany, "Structure of holism: What it takes for probability distributions to be separable and to factorize", August 2005.

New PhDs' Seminar in Physics and Philosophy, University of Illinois at Chicago, "Weyl, Einstein, and the epistemology of a theory of everything, and Structure of holism: A new decomposition of Jarrett completeness", July 2005.

University of Illinois at Chicago, Department of Philosophy, Philosophy of physics discussion group, "The logic of holism", June 2004.

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Bonn-Cologne Spring School in Philosophy of Physics, Wermelskirchen, Germany,
“Separability implies factorizability”, March 2004.

FELLOWSHIPS, AWARDS, AND CERTIFICATIONS

Harper-Schmidt Fellowship, Society of Fellows, University of Chicago, September 2008 – current.

Sawyer Predoctoral Fellowship, Illinois Institute of Technology, August 2006 – May 2008.

Best Paper, 4th International Summer School in Philosophy, Probability, and Physics, University of Konstanz, Germany, August 2005.

Certification in Teaching of Writing and Rhetoric, Notre Dame Writing Center, May 2005.

Graduate Teaching Fellowship (awarded to four graduate students each year following a campus-wide competition), University of Notre Dame, College of Arts and Sciences and Graduate School, 2005–6.

Dissertation Year Fellowship, University of Notre Dame, 2003–4.

Benjamin Franklin Scholar Research Grant, for combined film/writing project, University of Pennsylvania, Summer 1995.

Benjamin Franklin Scholars Honor Society, 1995 to present.

Phi Beta Kappa (inducted as a junior).

Dean’s List, University of Pennsylvania, 1991–2 and 1994–5.

TEACHING EXPERIENCE

Collegiate Assistant Professor, Division of Humanities, University of Chicago, September 2008 – present. Courses:

- *Philosophical Perspectives in the Humanities*, Autumn 2008.

Teaching Fellow, Department of Humanities, Illinois Institute of Technology, August 2006 – present. Courses:

- *Age of Darwin*, Fall 2006, Spring 2007, Fall 2007, scheduled Spring 2008.
- *Philosophy of Physics*, Fall 2006, Fall 2007.
- *Science and Method*, Spring 2007.
- *Philosophy of Logic*, scheduled Spring 2008.

Instructor, Department of Philosophy, University of Notre Dame, September 2004 – May 2006. Courses:

- *The experiencing of medicine, science, art, and literature*, Fall 2005.
- *First year composition*, Fall 2005.
- *Introduction to philosophy*, Spring 2005.
- *Introduction to philosophy*, Fall 2004.

Teaching Assistant, Department of Philosophy, University of Notre Dame, Fall 2000 – Spring 2003. Courses:

- *Philosophical issues in physics* (Philosophy 389 / Physics 309), Spring 2003 (Included occasional lecturing).
- *Introduction to philosophy* (Philosophy 101), Fall 2000, Spring 2001, Fall 2002.

PROFESSIONAL EXPERIENCE

Collegiate Assistant Professor, Division of Humanities, University of Chicago, September 2008 – present.

Pre-doctoral Fellow, Department of Humanities, Illinois Institute of Technology, August 2006 – present.

Instructor/Teaching Assistant, Department of Philosophy, University of Notre Dame, September 2000 – May 2006.

Research Assistant, History and Philosophy of Science Program, University of Notre Dame, September 2001 – May 2002. Assisted Professor Don Howard in preparation of background materials for conference papers.

PROFESSIONAL ACTIVITIES

Referee for *British Journal for the Philosophy of Science*

PROFESSIONAL MEMBERSHIPS

American Philosophical Association

Philosophy of Science Association

American Physical Society

REFERENCES

Professor Don Howard (*advisor – HPS*)
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Professor Warren Schmaus (*teaching*)
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