

Curriculum Vitae

Katherine Brading

Assistant Professor of Philosophy, University of Notre Dame

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Department of Philosophy, 100 Malloy Hall
University of Notre Dame, Notre Dame, IN 46556, USA

HIGHER EDUCATION

D.Phil., Philosophy

University of Oxford, October 1997 – December 2001

Thesis: ‘Symmetries, Conservation Laws, and Noether’s Variational Problem’

Supervisor: Dr. H. R. Brown (Reader in Philosophy of Physics, University of Oxford)

Examiners: Professor M. Redhead (London School of Economics)

Dr. S. Saunders (Lecturer in Philosophy of Science, University of Oxford)

B.Phil., Philosophy

University of Oxford, October 1994 – June 1996

Thesis: ‘The Metaphysics of Causation’

ExamPapers: Philosophy of Science and Philosophy of Physics

Seventeenth-Century Physics

Philosophical Logic and Philosophy of Language

B.Sc., Physics and Philosophy, First Class Honours

King’s College London, University of London, October 1989 – June 1992

SCHOLARSHIPS, STUDENTSHIPS, FELLOWSHIPS AND GRANTS

National Science Foundation grant (NSF SES-0724383 Brading 201201), project entitled ‘Structuralist Approaches to Physics’ (2007-2008).

Reilly Fellow, John J. Reilly Center for Science, Technology and Values, University of Notre Dame.

Junior Research Fellow in Philosophy of Science, Wolfson College, Oxford (October 2000 – April 2004).

Eunice Dutoil Turner Scholar in Philosophy, St Hugh’s College, Oxford (October 1999 - October 2000).

British Academy Studentships (October 1994 - June 1996; October 1999 - December 2000).

I am grateful to ISLA for their grants supporting conference attendance in Leiden (2007); Paris and Bucharest (2008).

EMPLOYMENT HISTORY

October 2000 – April 2004, Junior Research Fellow in Philosophy of Science, Wolfson College, Oxford.

1997 – 2002, tutoring and lecturing in philosophy for five Oxford Colleges, the Oxford University

Department of Continuing Education, and the Stanford Program in Oxford.

October 1992 – September 1994, Nuclear Safety Engineer, Nuclear Electric plc, Gloucester, England.

PROFESSIONAL MEMBERSHIPS

British Society for the Philosophy of Science
Philosophy of Science Association

BOOKS AND MONOGRAPHS

Co-editor: *Symmetries in Physics: Philosophical Reflections*, K. A. Brading and E. Castellani (eds.), Cambridge University Press, 2003. Including a substantial introduction by the editors (pp. 1-18).

REFEREED PUBLICATIONS

- ‘Hilbert’s “Foundations of Physics”’: Gravitation and electromagnetism within the axiomatic method’, with T. A. Ryckman, *Studies in the History and Philosophy of Modern Physics* **39**, 2008, pp. 102-153.
- *Book review* of L. Corry, *David Hilbert and the Axiomatization of Physics (1898-1918)*, in *Philosophia Mathematica (III)* **15**, 2007, 1-16.
- ‘Symmetry in classical physics’, with Dr. E. Castellani, in J. Butterfield and J. Earman (eds.), *Handbook of the Philosophy of Physics*, North-Holland, 2007, pp. 1331-1367.
- ‘Scientific Structuralism: Presentation and Representation’, with Dr. E. Landry, *Philosophy of Science* **73**, 2006, pp. 571-81.
- ‘A Note on General Relativity, Energy Conservation, and Noether’s Theorems’, *The Universe of General Relativity, Einstein Studies Vol 11*, A. J. Kox and J. Eisenstaedt (eds.), 2005, pp. 125-135.
- ‘Where lies the empirical significance of symmetry in physics?’, *Symétries, Contributions au séminaire de Hans-Sur-Lesse*, P. Radelet (ed.), Brepols Publishers n. v., Turnhout, Belgium, 2005. pp. 63-71.
- ‘Are gauge symmetry transformations observable?’, with Dr. H. R. Brown, *The British Journal for the Philosophy of Science* **55**, 2004, pp. 645-665.
- ‘Symmetries and Noether’s Theorems’, with Dr. H. R. Brown, in *Symmetries in Physics: Philosophical Reflections*, K. A. Brading and E. Castellani (eds.), Cambridge University Press, 2003, pp. 89-109.
- ‘Symmetry and Symmetry-Breaking’, *Stanford Encyclopedia of Philosophy*, with Dr. E. Castellani, 2003 (11,000 words, approximately). See <http://plato.stanford.edu/entries/symmetry-breaking/>.
- ‘Symmetry and Symmetry-Breaking’, *The Oxford Companion to the History of Modern Science*, OUP, 2003, pp. 784-786.
- ‘General Covariance from the Perspective of Noether’s Theorems’, with Dr. H. R. Brown, *Diálogos* **79**, 2002, pp. 59-86.

- ‘Which Symmetry? Noether, Weyl and Conservation of Electric Charge’, *Studies in the History and Philosophy of Modern Physics* **33**, 2002, pp. 3-22.
- ‘The Concept of a Hypothesis in Seventeenth Century Physics’, *Krisis* **8**, 2000, pp. 5-16.

INVITED TALKS

September 2008, Beyond Einstein: Historical Perspectives on Geometry, Gravitation, and Cosmology in the Twentieth Century, Mainz, Germany.

- ‘Hilbert and Einstein’s General Theory of Relativity: Two Communications on the Foundations of Physics’

June 2008, *Bucharest colloquium in Early Modern Philosophy*, Bucharest, Romania.

- ‘On composite systems: Descartes, Newton, and the law-constitutive approach’

June 2008, *Perspective in Physics and Philosophy*, Ecole Polytechnique, Paris, France.

- ‘On epistemic structuralism: objectivity, conventionalism, and idealism in Poincare’s philosophy of science’

March 2008, *Department of Philosophy, Duke University*

- ‘Objects, individuals, and structures: in search of fundamental ontology’

October 2007, *Symposium on Time and Relativity, Institute for Advanced Studies, University of Minnesota*

- ‘What’s in a theory? Hilbert and the “Harvey Brown pedagogy”’

August 2007, *Structure, Objects, and Causality Workshop*, Banff, Canada

- ‘Structuralist approaches to physics: objects, models and modality’

April 2007, *Philosophical and formal foundations of modern physics*, workshop organized by the Centre de Recherche en Epistemologie Appliquée

- ‘Hilbert, the Foundations of Physics, and Einstein’s General Theory of Relativity’

December 2006, *Department of History and Philosophy of Science, Indiana University at Bloomington*

- ‘Hilbert, Causality, and the Foundations of Physics’

May 2006, *The metaphysics of physics: philosophical implications of contemporary physical theories, 28th Annual Philosophy Conference, Santa Clara University*

- ‘Objects of Physics’

February 2005, *Boston Colloquium for Philosophy of Science*

- ‘Structuralism and the Objects of Physics’

December 2003, *British Society for the Philosophy of Science, London*

- ‘Powerful Structures’

February 2003, *University of Minnesota, Minneapolis*

- ‘Powerful Structures’, Philosophy seminar.

February 2003, *University of Chicago, Illinois*

- ‘Powerful Structures’, Philosophy seminar.

February 2003, *University of Notre Dame, Indiana*

- ‘Powerful Structures’, Philosophy seminar.

May 2002, *University of Notre Dame, Indiana*

- ‘Some Philosophical Reflections on Symmetries in Physics’, Philosophy Seminar.
- ‘Noether’s Theorems: Origins and Unfamiliar Consequences’, Physics Seminar.

May 2002, *Seven Pines Symposium VI, Minneapolis*

- ‘Some Philosophical Reflections on Symmetries in Physics’, as part of the symposium ‘Symmetry and Symmetry Breaking in Physics’.

February 2002, *University of Calgary, Canada*

- ‘How to see that *The Universe Doesn’t Care*’, Philosophy Seminar.
- ‘Noether’s Theorems: Origins and Unfamiliar Consequences’, Physics Seminar.
- ‘All Alone in the Universe: Individuals in Descartes and Newton’, History and Philosophy of Science Research Group.

November 2001, *Catholic University of Louvain, Belgium*

- ‘The history of the gauge concept from Weyl to Yang-Mills’, as part of a seminar series in history of physics, ‘Fondements et notions fondamentales’.

April 2001, *Centre for Research in Applied Epistemology (CREA), Paris*

- ‘A Theme from Weyl’s ‘Grand Symphony’ and some Noether Variations’, as part of the series ‘Transcendental Arguments in Physics’.

December 2000, *University of Leeds*

- ‘Galileo’s Ship and Descartes’ Stone: Symmetries and Conservation Laws in Physics’, Philosophy Seminar.

October 2000, *University of Berkeley, California*

- ‘A Theme from Weyl’s ‘Grand Symphony’ and some Noether Variations’, History and Philosophy of Logic, Mathematics and Science Seminar, October 2000.
- ‘Noether’s Theorems: Origins and Unfamiliar Consequences’, Lawrence Berkeley National Laboratory, Centre for Beam Physics Seminar.

June 2000, *University of Bristol*

- ‘Which Symmetry? Noether, Weyl, and conservation of electric charge’, Philosophy of Physics Seminar.

February 2000, *Catholic University of Louvain, Belgium*

- ‘Which Symmetry? Noether, Weyl, and conservation of electric charge’, Physics Seminar.

- ‘All Alone in the Universe: The concept of an isolated system in Descartes and Newton’, as part of the Inter-disciplinary Seminar Series “*Les mots pour le dire - La terminologie scientifique*”.

January 2000, *University of Concordia, Montreal, Canada*

- ‘Galileo’s Ship and Descartes’ Stone: Symmetries and Conservation Laws in Physics’, *Annual Joint Symposium of the Mathematics and Philosophy Departments*.

January 2000, *University of Western Ontario, Canada*

- ‘Which Symmetry? Noether, Weyl, and conservation of electric charge’, Philosophy Seminar. November 1999, *University of Oxford*
- ‘Which Symmetry? Noether, Weyl, and conservation of electric charge’, Philosophy of Physics Seminar.

April 1999, *New Europe College, Bucharest, Romania*

- ‘All Alone in the Universe: Descartes, Newton, and the Introduction of Isolated Systems into Natural Philosophy’. Joint presentation with Dana Jalobeanu.

February 1999, *University of Cambridge*

- ‘All Alone in the Universe: Descartes, Newton, and the Introduction of Isolated Systems into Natural Philosophy’, History and Philosophy of Science Department. Joint presentation with Dana Jalobeanu.

CONFERENCE PAPERS

November 2008, *Philosophy of Science Association* biennial meeting, Pittsburgh: ‘Autonomous Patterns and the Objects of Physics’, as part of a symposium *Phenomena, Data, and Patterns*, jointly organized with James McAllister (Leiden).

March 2007, 11th Inland Northwest Philosophy Conference, *Carving Nature at its Joints*, ‘Objects of Physics’.

June 2007, *Newton and/as Philosophy*, Leiden: ‘Newton on bodies: a response to Descartes’. (I am grateful to ISLA and the Philosophy Department for their financial support for attending this conference.)

November 2004, *Philosophy of Science Association* biennial meeting, Austin: ‘A Minimal Construal of Scientific Structuralism. With Dr. E. Landry.

June 2004, *HOPOS*, San Francisco, ‘Hilbert’s second communication on The Foundations of Physics’. With Dr. T. A. Ryckman.

January 2003, *Symmetries and Structures in Physics*, Oxford: ‘Some variations on a Noether theme’.

June 2002, *Sixth International Conference on the History of General Relativity*, Amsterdam: ‘General Relativity and Noether’s Variational Problem’.

May 2002, *Understanding Symmetry in Physics*, Joint Princeton-Oxford meeting, Princeton: ‘Some variations on a Noether theme’.

January 2001, *Oxford Workshop on Symmetries in Physics: 'Noether's Theorems and Gauge Symmetries'*. Joint presentation with Dr. H. R. Brown.

August 1999, *11th International Congress on Logic, Methodology and History of Science*, Cracow, Poland: 'All Alone in the Universe: Descartes, Newton, and the Introduction of Isolated Systems into Natural Philosophy'. Joint presentation with Dana Jalobeanu.

July 1999, *18th Workshop on Geometrical Methods in Physics*, Bialowieza, Poland: 'Philosophy of Physics: the early days of gauge theories'.

March 1999, *Representations: Philosophy, Art and Science*, Centre for History and Philosophy of Science, Stanford University in Florence: 'Noether's theorem'.

GRADUATE STUDENT ACTIVITIES

Dissertation committees: Brandon Fogel (2008); Brian Pitts (2008).

Dissertation proposal committees: Brian Pitts.

Orals committees: Iulian Toader; Elise Crull (2009).

Directed readings: Elise Crull (Fall 2007); Robby Gustin (Spring 2009).

UNDERGRADUATE STUDENT ACTIVITIES

Senior thesis supervision: Beata Aldridge (2008/09).

PROFESSIONAL ACTIVITIES

Referee for *Studies in History and Philosophy of Modern Physics*, *Studies in History and Philosophy of Science*, *International Studies in the Philosophy of Science*, *The British Journal for the Philosophy of Science*, *Erkenntnis*.

Member of the Editorial Advisory Board for *Studies in History and Philosophy of Modern Physics* (since 2007).

Member of the International Board of the Research Centre for the Foundations of European Modernity, University of Bucharest.

Member of the committee for the *British Society for the Philosophy of Science*, 2003-4.