

CURRICULUM VITÆ HANS HALVORSON

Department of Philosophy
Princeton University
Princeton, NJ 08544
www.princeton.edu/~hhalvors

Professional history

2008–09 Visiting Researcher, Mathematical Institute, University of Utrecht
2005– Associate Professor, Princeton University
2001–05 Assistant Professor, Princeton University

Educational history

2001 PhD, Philosophy, University of Pittsburgh
1998 MA, Mathematics, University of Pittsburgh
1997 MA, Philosophy, University of Pittsburgh
1995 BA (honors), Philosophy, Calvin College

Research focus

Category Theory and Mathematical Logic (active); Foundations of Quantum Field Theory (dormant)

Areas of competence

Philosophy of Mathematics, Philosophy of Science, Philosophy of Religion

Publications

“The mind in quantum mechanics,” forthcoming in *The Soul Hypothesis*, ed. Mark Baker and Stewart Goetz.

“Algebraic quantum field theory” (with Michael Müger) in *Handbook of The Philosophy of Physics*, edited by J. Butterfield and J. Earman. Kluwer (2006), pp. 731–922.

“Quantum mechanics” in *The Philosophy Of Science: An Encyclopedia*, edited by J. Pfeifer and S. Sarkar. Routledge, 2006.

- “Locality” in *The Philosophy Of Science: An Encyclopedia*, edited by J. Pfeifer and S. Sarkar. Routledge, 2006.
- “Can quantum cryptography imply quantum mechanics? Reply to Smolin” (with J. Bub) *Quantum Information and Computation* 5, 170–175 (2005).
- “Remote preparation of arbitrary ensembles and quantum bit commitment” *Journal of Mathematical Physics* 45, 4920–4931 (2004).
- “On information-theoretic characterizations of physical theories” *Studies in History and Philosophy of Modern Physics* 35, 277–293 (2004).
- “Complementarity of representations in quantum mechanics” *Studies in History and Philosophy of Modern Physics* 35, 45–56 (2004).
- “Characterizing quantum theory in terms of information-theoretic constraints” (with J. Bub and R. Clifton) *Foundations of Physics* 33, 1561–1591 (2003).
- “Reconsidering Bohr’s reply to EPR” (with R. Clifton) in *Non-locality and Modality*, edited by T. Placek and J. Butterfield. Kluwer (2002), pp. 3–18.
- “Review of Harald Atmanspacher: On Quanta, Mind, and Matter” *Studies in History and Philosophy of Modern Physics* 33, 744–747 (2002).
- “No place for particles in relativistic quantum theories?” (with R. Clifton) *Philosophy of Science* 69, 1–28 (2002).
 – Also appears in *The Philosopher’s Annual* XXV (2002).
 – Also appears in *Ontological Aspects of Quantum Field Theory*, M. Kuhlmann et al., eds. World Scientific (2002), pp. 181–213.
- “Are Rindler quanta real? Inequivalent particle concepts in quantum field theory” (with R. Clifton) *British Journal for the Philosophy of Science* 52, 417–470 (2001).
- “Review of Pieter Vermaas: A Philosopher’s Understanding of Quantum Mechanics” *British Journal for the Philosophy of Science* 52, 387–391 (2001).
- “On the nature of continuous physical quantities in classical and quantum mechanics” *Journal of Philosophical Logic* 30, 27–50 (2001).
 – Also appears in *The Philosopher’s Annual* XXIV, 41–65 (2001).

- “Reeh-Schlieder defeats Newton-Wigner. On alternative localization schemes in relativistic quantum field theory” *Philosophy of Science* 68, 111–133 (2001).
 – *Philosophy of Science* best paper by a recent PhD, 2001.
- “Entanglement and open systems in algebraic quantum field theory” (with R. Clifton) *Studies in History and Philosophy of Modern Physics* 32, 1–31 (2001).
- “The Einstein-Podolsky-Rosen state maximally violates Bell’s inequalities” *Letters in Mathematical Physics* 53, 321–329 (2000).
- “Generic Bell correlation between arbitrary local algebras in quantum field theory” (with R. Clifton) *Journal of Mathematical Physics* 41, 1711–1717 (2000).
- “Non-local correlations are generic in infinite-dimensional bipartite systems” (with R. Clifton and A. Kent) *Physical Review A* 61, 042101 (2000).
- “Bipartite mixed states of infinite-dimensional systems are generically non-separable” (with R. Clifton) *Physical Review A* 61, 012108 (2000).
- “Maximal beable subalgebras of quantum mechanical observables” (with R. Clifton) *International Journal of Theoretical Physics* 38, 2441–2484 (1999).
- “Superentangled states” (with R. Clifton, D. Feldman, M. Redhead, and A. Wilce) *Physical Review A* 58, 135–145 (1998).

Edited book

- J. Butterfield and H. Halvorson, editors. *Quantum Entanglements: Selected Papers Of Rob Clifton*, Oxford University Press, 2004. (With a chapter length introduction by the editors.)

Dissertation

- Locality, localization, and the particle concept: Topics in the foundations of quantum field theory*. University of Pittsburgh, 2001. Advisor: Rob Clifton

Recent presentations

- “Antimatter and the metaphysics of quantity.” University of Texas at Austin, Nov 2007.
- “Nonlocal boxes and C^* -algebras.” Perimeter Institute for Theoretical Physics, May 2006.
- “The fate of paraparticles.” Minnesota Center for the Philosophy of Science, Apr 2006.
- “Otherworldly information theory.” Boston Colloquium for Philosophy of Science, Mar 2006.
- “Deriving quantum mechanics from information theoretic axioms.” Wheelerfest (conference in honor of John Wheeler), Princeton NJ, Feb 2006.
- “No reductive physicalism, no measurement problem.” New Directions in the Foundations of Physics, College Park, MD. Apr 2005.
- “No reductive physicalism, no measurement problem.” Philosophy Colloquium, University of Southern California. Jan 2005.
- “Algebraic quantum field theory.” Philosophy of Physics Mini-Conference, University of Pittsburgh. Oct 2004.
- “No reductive physicalism, no measurement problem.” Philosophy Colloquium, University of Notre Dame. Sep 2004.
- “A no bit commitment theorem for infinite quantum systems.” Conference: C^* -algebras and Quantum Information Theory. Los Angeles. Jun 2004.
- “Information theoretic axioms for quantum mechanics?” Conference: *Contemporary Issues in Philosophy of Physics*. University of Western Ontario. May 2004.
- “Can quantum cryptography imply quantum mechanics?” Philosophy of Physics Colloquium, University of Maryland. Nov 2003.
- “Past times.” Time Seminar, Princeton University Council of the Humanities. Nov 2003.
- “Characterizing quantum theory in terms of information-theoretic constraints.” Oxford-Princeton workshop in philosophy of physics. Mar 2003.

“Bohr versus Bohm on ontological pluralism,” Symposium: *Bohr’s Philosophy of Quantum Theory*. Philosophy of Science Association Biennial Meeting. Nov 2002.

“Complementarity in quantum field theory.” Boston Colloquium for Philosophy of Science. Oct 2002.

“Objective indeterminacy: A prolegomenon to Niels Bohr’s philosophy of quantum theory.” Princeton Philosophical Society, May 2002.

“Nonexistent quantities in quantum theory.” Conference: *New Directions in the Foundations of Physics*, College Park, MD. May 2002.

“Complementarity of representations in quantum mechanics.” Conference: *Philosophy of Mathematics in Application*. Logic & Philosophy of Science Dept, UC Irvine. Mar 2002.

“Reconsidering Bohr’s reply to EPR.” Conference: *Modality, Probability, and Bell’s Theorem*. Jagiellonian University (Poland). Aug 2001.

“Complementarity of representations in quantum mechanics.” International Quantum Structures Association Biennial Meeting. Mar 2001.

“The ‘substance’ of complementarity: Niels Bohr, quantum field theory, and particle metaphysics.” Princeton University, Feb 2001; University of Notre Dame, Jan 2001; University of Michigan, Jan 2001.

“Max Planck as a philosopher of science.” University of Pittsburgh, Dec 2000.

“Does relativity imply nonlocality? Unpacking the Reeh-Schlieder theorem.” Logic & Philosophy of Science Dept, UC Irvine, May 2000.

“Generic nonlocality in Theories of Everything.” (with R. Clifton), Centre for Philosophy of Natural and Social Science, London School of Economics. Nov 1999.

Fellowships and Awards

New Directions Fellowship, Andrew Mellon Foundation: 2008–09

Behrman Fellowship in the Humanities, Princeton University: 2005–08

Associate Fellow, Center for the Philosophy of Science, University of Pittsburgh: 2002–

Article named as one of “ten best in philosophy for the year 2002,” *The Philosopher’s Annual*.

Article named as one of “ten best in philosophy for the year 2001,” *The Philosopher’s Annual*.
Article named as “best of the year by a recent PhD, 2001,” the Philosophy of Science Association.
James Cushing Memorial Prize in the History and Philosophy of Physics: 2004
Short Term Fellow, Perimeter Institute for Theoretical Physics (Waterloo, Ontario): May 2006
Princeton 250th Anniversary Fund for Innovation in Undergraduate Education: awarded grant for enhancing Introductory Logic: 2005
Hewlett International Exchange travel grant (Cracow, Poland): 2001
International Quantum Structures Association travel grant: 2001
Alan Ross Anderson Fellowship for Philosophical Logic, University of Pittsburgh: 1997
Younger Scholars Graduate Fellowship, Pew Charitable Trust: 1995–98

Languages

Dutch B2, German C1
(CEFR www.coe.int/T/DG4/Linguistic/Source/Framework_EN.pdf)

Teaching (at Princeton, unless otherwise noted)

Dissertations Supervised

- Joseph Rachiele, expected 2011
- Giovanni Valente, University of Maryland, 2009 (co-supervised with Jeffrey Bub)
- David Baker, 2008
- Tracy Lupher, University of Texas, 2008 (external reader)

Graduate Seminars

- Dissertation seminar
- Quantum information theory and the foundations of quantum mechanics (with B. van Fraassen)
- Metaphysics of physics (with J. Butterfield)
- Foundations of quantum field theory
- Scientific realism and antirealism
- From physics to metaphysics (with A. Elga)
- Directed studies which led to graduate units: philosophy of science (scientific explanation, syntactic vs. semantic view of theories), philosophy

of physics (interpretation of quantum mechanics, nonlocality, spacetime substantivalism), philosophy of religion.

Undergraduate Courses

- Philosophy of physics
- Philosophical logic
- Introductory symbolic logic
- Senior theses directed: philosophy of physics (quantum information theory, spacetime), philosophy of science (laws of nature), philosophy of biology (evolution), philosophy of medicine (concept of disease), philosophy of religion, metaphilosophy.
- Junior papers directed: philosophy of physics (quantum mechanics), philosophy of space and time, bioethics (definition of “life” and moral status of fetus), philosophy of religion, metaphysics (physicalism)

Teaching Assistant (Pittsburgh)

- Philosophy of religion
- Introduction to ethics
- Introduction to logic
- History of modern philosophy

Community service, departmental committees, and outside memberships

Princeton University Research Board: 2007–

Director of Graduate Studies, Princeton Philosophy Dept: 2007–08

Program Committee, Philosophy of Science Association Biennial Meeting:
2006

Co-organizer of Oxford-Princeton partnership in philosophy of physics (2001–present),
first annual workshop (May 4–6, 2002), and student exchange

Invited participant in Princeton Council of the Humanities monthly faculty
seminar: 2003–04

Referee for *Australasian Journal of Philosophy*, *British Journal for the Philosophy of Science*, *Canadian Journal of Philosophy*, *Communications in Mathematical Physics*, *Erkenntnis*, *Foundations of Physics*, *Journal of Mathematical Physics*, *Journal of Physics A*, *Notre Dame Journal of Formal Logic*, *Philosophy of Science*, *Physics Letters A*, *Physical Review Letters*, *Reviews of Mathematical Physics*, *Studies in History and Philosophy of Modern Physics*, Elsevier, Oxford University Press, Oneworld Publications, US National Science Foundation, Israel National Science Foundation, Social Sciences and Humanities Research Council of Canada.

Reviewer for American Mathematical Society Math Reviews
Language examiner for graduate units (German), Princeton Philosophy Dept:
2001–
Graduate admissions committee, Princeton Philosophy Dept: 2001–02, 2003–06,
2007–08
Curriculum committee, Princeton Philosophy Dept: 2001–03, 2004–06, 2007–08
Computer committee, Princeton Philosophy Dept: 2004–06
Reader for Princeton Society of Fellows selection process: 2001–02
General examination, final public oral examination committees, Princeton
Philosophy Dept: 2001–