Curriculum Vitæ
Hans Halvorson

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

Permanent positions

2016–	Stuart Professor of Philosophy
2012–	associated faculty, mathematics
2010–	full professor, philosophy
2005–10	associate professor, philosophy
2001–05	assistant professor, philosophy

Temporary positions

2002–	associate fellow, Pittsburgh Center for the Philosophy of Science
2008–09	visiting researcher, Mathematical Institute, Utrecht
2006	visiting fellow, Perimeter Institute for Theoretical Physics

Education

2001	PhD philosophy, Pittsburgh
1999	Visiting Student Researcher, Oxford
1998	MA mathematics, Pittsburgh
1997	MA philosophy, Pittsburgh
1995	BA philosophy, with honors, Calvin College

Work in progress

HH. *Logic for Humans.* Princeton University Press (2019)

HH. *The Logic of Theories.* Cambridge University Press (2019)

HH. "Effective theories"

HH. "The invariant structure of equivalent theories" committed to *The Semantics of Scientific Theories*, ed. E. Curiel and S. Lutz.

A. Briggs, A. Steane, and HH. *It Keeps Me Seeking.* Oxford University Press (2018)

Articles and book chapters

D. Tsementzis and HH. "Foundations and philosophy" forthcoming in Philosophers' Imprint.

D. Tsementzis and HH. "Categories of scientific theories" in *Categories for the Working Philosopher*, ed. Elaine Landry. Springer (2018)

HH. "A theological critique of the fine-tuning argument" in *Knowledge, Belief, and God: New Insights*, ed. Matt Benton et al. (2018)

T. Barrett and HH. "From geometry to conceptual relativity" Erkenntnis 82, 1043–1063 (2017)

T. Barrett and HH. "Quine's conjecture on many sorted logic" Synthese 194, 3563–3582 (2017)

T. Barrett and HH. "Morita equivalence" Review of Symbolic Logic 9, 556–582 (2016)

T. Barrett and HH. "Glymour and Quine on theoretical equivalence" Journal of Philosophical Logic 45, 467–483 (2016)

HH. "Scientific theories" in *The Oxford Handbook of Philosophy of Science*, pp 585–608. ed. P. Humphreys. Oxford University Press (2016)

HH. "Why methodological naturalism?" in *The Blackwell Companion to Naturalism*, pp 136–149. ed. K. Clark. Blackwell (2016)

D.J. Baker, N. Swanson, and HH. "The conventionality of parastatistics" British Journal for the Philosophy of Science 66, 929–976 (2015)

HH. "Plantinga on providence and physics" *European Journal for Philosophy of Religion* 5, 19–30 (2013)

D.J. Baker and HH. "How is spontaneous symmetry breaking possible?" *Studies in history and philosophy of modern physics* 44: 464–469 (2013)

HH. "Review of *Platonism, naturalism, and mathematical knowledge*" *Notre Dame Philosophical Reviews*. Jul (2013)

HH. "The semantic view, if plausible, is syntactic" *Philosophy of Science* 80: 475–478 (2013)

HH. "Ruetsche on the pristine and adulterated in quantum field theory" *Metascience* 22: 69–75 (2013)

HH. "What scientific theories could not be" *Philosophy of Science* 79: 183–206 (2012)

HH and H. Kragh. "Theism and physical cosmology" *Routledge Companion to Theism*, ed. C. Taliaferro et al., pp. 241–255 (2012)

HH and H. Kragh. "Cosmology and theology". *Stanford Encyclopedia of Philosophy* (2011)

HH. "The measure of all things: quantum mechanics and the soul" In *The soul hypothesis: investigations into the existence of the soul* ed. M. Baker and S. Goetz, pp. 138–163. Continuum Press (2010)

D.J. Baker and HH. "Antimatter" *British journal for the philosophy of science* 61: 93–121 (2010)

HH and M. Müger. "Algebraic quantum field theory" in *Handbook of the Philosophy of Physics*, ed. J. Butterfield and J. Earman. Kluwer (2006), 731–922.

HH. "Quantum mechanics" in *The philosophy of science: an encyclopedia*, ed. J. Pfeifer and S. Sarkar. Routledge 2006

HH. "Locality" in *The philosophy of science: an encyclopedia*, ed. J. Pfeifer and S. Sarkar. Routledge 2006

J. Bub and HH. "Can quantum cryptography imply quantum mechanics?" *Quantum information and computation* 5: 170–175 (2005)

HH. "Remote preparation of arbitrary ensembles and quantum bit commitment" *Journal of mathematical physics* 45: 4920–4931 (2004)

HH. "On information-theoretic characterizations of physical theories" *Studies in history and philosophy of modern physics* 35: 277–293 (2004)

HH. "Complementarity of representations in quantum mechanics" *Studies in history and philosophy of modern physics* 35: 45–56 (2004)

R. Clifton, J. Bub and HH. "Characterizing quantum theory in terms of information-theoretic constraints" *Foundations of physics* 33: 1561–1591 (2003)

HH and R. Clifton. "Reconsidering Bohr's reply to EPR" in *Non-locality and modality*, ed. T. Placek and J. Butterfield. Kluwer (2002), pp. 3–18

HH. "Review of *On quanta, mind, and matter* by Harald Atmanspacher" *Studies in history and philosophy of modern physics* 33: 744–747 (2002)

HH and R. Clifton. "No place for particles in relativistic quantum theories?" *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

R. Clifton and HH. "Are Rindler quanta real? Inequivalent particle concepts in quantum field theory" *British journal for the philosophy of science* 52: 417–470 (2001)

HH. "Review of *A philosopher's understanding of quantum mechanics* by Pieter Vermaas" *British journal for the philosophy of science* 52: 387–391 (2001)

HH. "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)

HH. "Reeh-Schlieder defeats Newton-Wigner. On alternative localization schemes in relativistic quantum field theory" *Philosophy of science* 68: 111–133 (2001)

- Awarded best paper by a recent PhD 2001, Philosophy of Science Association

R. Clifton and HH. "Entanglement and open systems in algebraic quantum field theory" *Studies in history and philosophy of modern physics* 32: 1–31 (2001)

HH. "The Einstein-Podolsky-Rosen state maximally violates Bell's inequalities" *Letters in mathematical physics* 53: 321–329 (2000)

HH and R. Clifton. "Generic Bell correlation between arbitrary local algebras in quantum field theory" *Journal of mathematical physics* 41: 1711–1717 (2000)

R. Clifton, HH and A. Kent. "Non-local correlations are generic in infinite-dimensional bipartite systems" *Physical review A* 61: 042101 (2000)

R. Clifton and HH. "Bipartite mixed states of infinite-dimensional systems are generically nonseparable" *Physical review A* 61:, 012108 (2000)

R. Clifton and HH. "Maximal beable subalgebras of quantum mechanical observables" *International journal of theoretical physics* 38: 2441–2484 (1999)

R. Clifton, D. Feldman, HH, M. Redhead, and A. Wilce. "Superentangled states" *Physical review A* 58: 135–145 (1998)

Books

HH, editor. *Deep Beauty: Understanding the Quantum World through Mathematical Innovation.* Cambridge University Press, 2011

J. Butterfield and HH, editors. *Quantum Entanglements: Selected Papers of Rob Clifton.* Oxford University Press, 2004

HH. *Locality, Localization, and the Particle Concept: Topics in the Foundations of Quantum Field Theory.* PhD Thesis, University of Pittsburgh, 2001

Unpublished papers and notes

HH and T. Barrett. "How to count structure"

S. Wolters and HH. "Independence conditions for nets of local algebras as sheaf conditions" arxiv:1309.5639

HH and N. Swanson. "Comment on the structure of physics" philsci-archive/9314

HH. "Does quantum theory kill time?"

Articles for broader audiences

"Fine-tuning does not imply a fine tuner" Nautilus, January 2017

"Matter" Edge Question 2017

"Einstein was wrong" Edge Question 2016

"What does quantum mechanics suggest about our perceptions of reality?" Big Questions Online 2015

"When is belief in miracles rational?" Slate 2015

"Meta-thinking" Edge Question 2015

"Quantum envy" (with Adam Neder) Lutheran Forum 2007

"Comments on Clouser's claims for theistic science" PSCF 2006

Invited lectures and conference presentations

Something about logic and philosophy of science. University of Salzburg, June 2018

"The wave-function in itself" Conference: Identity, indistinguishability and non-locality in quantum physics. Buenos Aires. Jun 2017

"The invariant content of equivalent theories" CSLI Workshop on Logic, Rationality, and Intelligent Interaction. Stanford University. Jun 2017

"Natural probability." Rutgers Probability Seminar. Feb 2017

"The invariant content of equivalent theories" Semantics of Scientific Theories Conference, LMU Munich. Jun 2016

"Probability and fine-tuning" Multiverse and Theodicy Conference, Rutgers. June 2016

"From geometry to conceptual relativity" (with T. Barrett) Society for Exact Philosophy Conference, Miami. May 2016

"The categorical approach to scientific theories." Notre Dame, Oct 2015

"Glymour and Quine on theoretical equivalence" (with T. Barrett) Logic, Relativity and Beyond Conference, Budapest. Aug 2015

"Divine and human agency in a quantum world" Science and Personal Action Conference, MIT. July 2015

"What's wrong with the fine-tuning argument?" New Insights and Directions in Religious Epistemology Conference, Oxford University. Jun 2015

"The invariant structure of equivalent theories" Rutgers University Philosophy Colloquium. Apr 2015

"Reality and equivalence in algebraic quantum theory" Nagoya Winter Workshop 2015: Reality and Measurement in Algebraic Quantum Theory. University of Nagoya, Japan. Mar 2015

"Univalent foundations: structuralist foundations?" (with D. Tsementzis). Association of Symbolic Logic Meeting. Philadelphia, Dec 2014

"Categories of scientific theories." Philosophy of Science Association Meeting. Chicago, Nov 2014

"Equivalent theories and invariant content." University of Southern California Philosophy Colloquium. Oct 2014

"Explanation via surplus structure" Sigma Club, London School of Economics. Mar 2014

"Does the universe need God?" Ian Ramsey Centre Lecture Series. Oxford University. Mar 2014

"Does the universe need God?" Faraday Institute Lecture Series. Cambridge University. Jan 2014

"Quantum theory of infinite systems: from fields to information" (three lecture series). Instituto de Física Fundamental. Madrid, Nov 2013

HH and J. Weatherall, "What is a scientific theory?" (two lecture series) Carnegie Mellon University. Sep 2013

"The conventionality of parastatistics" (with D. Baker and N. Swanson) Foundations of Physics, Munich. Jul 2013

"The invariant structure of equivalent theories" keynote lecture at LMP graduate conference, University of Western Ontario. May 2013

"Structuralist foundations for abstract mathematics" (with D. Tsementzis) Category-theoretic foundations of mathematics workshop, UC Irvine. May 2013

"The relativity of wrong, redux" Philosophy, Science and Religion Forum. CUNY, Laguardia Community College. May 2013

"What does physics have to do with theology anyway?" The Walton Lecture in Science, Philosophy, and Religion. Fordham University, Apr 2013

"Locality conditions as universal properties" (with S. Wolters) Conference on Relativistic Causality. University of Pittsburgh, Apr 2013

"What is a scientific theory?" Philosophy of Science Association Meeting. San Diego, Nov 2012

"Ruetsche on the pristine and adulterated in quantum field theory" Rotman Institute for Philosophy, University of Western Ontario. Sep 2012

"Ontological naturalism and the interpretation of quantum mechanics" PhysPhil Conference. St. Andrews University, Scotland. Sep 2012

"Philosophy of mind meets quantum mechanics" Summer School in Philosophy of Religion, University of St. Thomas, Minneapolis. Jun 2012

"Divine action in a quantum world?" *Faith, philosophy of science, and science.* Calvin College. Apr 2012

"What scientific theories could not be" University of Washington, Seattle. Nov 2011

"Does physical cosmology confirm theistic belief?" McIntyre Lecture on the Foundations of Physics. Wheaton College, Illinois. Nov 2011

"Foundations for categories, by categories" *Foundational Questions in the Mathematical Sciences.* Traunkirchen, Austria. July 2011

"Natural structure on state space" UC Irvine, Philosophy of Physics Workshop. Apr 2011

"What scientific theories could not be" UC Irvine, LPS Colloquium. Feb 2011

"Ontological naturalism and the interpretation of quantum mechanics" Philosophy Colloquium, Beijing University. Jun 2010

"Recent results on duality for the category of first-order theories" Mathematical Logic Seminar, University of Nijmegen. Feb 2009

"Notions of monoidal category" Operads Seminar, University of Utrecht. Jan 2009

"Antimatter and the metaphysics of opposites" University of Texas at Austin, Nov 2007

"Representing non-local boxes with C^*-algebras" Perimeter Institute for Theoretical Physics. May 2006

"On the conventionality of the claim, 'There are para-particles' " 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" Conference in honor of John Wheeler, Princeton. Feb 2006

"No reductive physicalism, no measurement problem" *New Directions in the Foundations of Physics.* College Park, Maryland. Apr 2005

"No reductive physicalism, no measurement problem" University of Southern California. Jan 2005

"No reductive physicalism, no measurement problem" University of Notre Dame. Sep 2004

"Algebraic quantum field theory" Center for Philosophy of Science, University of Pittsburgh. Oct 2004

"A generalized no-bit-commitment theorem for quantum systems" *C^*-algebras and quantum information theory.* UC Santa Barbara. Jun 2004

"Information-theoretic axioms for quantum mechanics" *Contemporary issues in philosophy of physics.* University of Western Ontario. May 2004

"Can quantum cryptography imply quantum mechanics?" University of Maryland. Nov 2003

"Can the quantum eraser undo the past?" Faculty Seminar on the Concept of Time, Princeton Council of the Humanities. Nov 2003

"Characterizing quantum theory in terms of information-theoretic constraints" Philosophy of Physics Workship, Oxford University. Mar 2003

"Bohr versus Bohm on ontological pluralism" Philosophy of Science Association Meeting, Milwaukee. 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

"Non-existent quantities in quantum mechanics" *New directions in the foundations of physics.* College Park, Maryland. May 2002

"Complementarity of representations in quantum mechanics" *Philosophy of mathematics in application.* UC Irvine. Mar 2002

"Reconsidering Bohr's reply to Einstein-Podolsky-Rosen" *Modality, probability, and Bell's theorem.* Jagiellonian University, Poland. Aug 2001.

"Complementarity of representations in quantum mechanics" International Quantum Structures Association Meeting. Cesena, Italy. 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

"Does relativity imply nonlocality? Unpacking the Reeh-Schlieder theorem" UC Irvine, May 2000

"Generic Nonlocality in Theories of Everything" (with R. Clifton). London School of Economics. Nov 1999

"Bell correlations in the vacuum: on a conjecture of David Malament" (with R. Clifton). Oxford University. Nov 1999

Prizes, Grants, and Fellowships

- TWCF Research Grant (co-PI Andrew Briggs) "Experimental tests of quantum reality" 2013–2016. $2.6M
- NSF Research Grant (co-PI David J. Baker) "Identical particles and statistics in superselection theory." 2011–12. $100K
- W.H. Tuck '12 Grant for International Research Collaboration, 2010–11
- Mellon New Directions in the Humanities Fellowship, 2008–09. $250K
- JTF Research Grant: "Understanding the quantum world through mathematical innovation." 2007
- Behrman Fellow, Princeton Council of the Humanities, 2005–08
- Princeton 250th Anniversary Fund for Innovation in Undergraduate Education, grant for developing logic curriculum, 2004
- James Cushing Memorial Prize in the History and Philosophy of Physics, 2004
- Article named among "Ten best articles in philosophy for the year 2002," *The Philosopher's Annual*
- Article named "Best by a recent PhD for the year 2001," Philosophy of Science Association
- Article named among "Ten best articles in philosophy for the year 2001" *The Philosopher's Annual*
- Alan Ross Anderson Fellowship for Philosophical Logic, Pittsburgh, 1997
- Pew Younger Scholars Graduate Fellow, 1995–98

Teaching and advising

Post-graduate mentoring: I worked with and wrote recommendation letters for the following students; an asterisk indicates that I was the primary advisor. Unless indicated otherwise, they were placed in tenure-track positions at the listed universities.

- Alex Meehan*: in progress
- David Schroeren*: in progress
- Robbie Hirsch*: postdoc at Princeton
- Thomas Barrett*: Bersoff Faculty Fellow NYU, UC Santa Barbara
- Dimitris Tsementzis*: postdoc at Rutgers
- Laurenz Hudetz (Salzburg): London School of Economics
- Neil Dewar (Oxford): LMU Munich
- Michaela McSweeney: Boston University
- Benjamin Feintzeig (UC Irvine): University of Washington
- Noel Swanson*: University of Delaware
- Samuel Fletcher (UC Irvine): University of Minnesota
- Sander Wolters (Nijmegen): postdoc at Nijmegen
- Nicholas Teh (Cambridge): University of Notre Dame
- Joe Rachiele*: Chapman University
- Joshua Hershey: The King's College NY
- Johanna Wolff (Stanford): King's College London
- Jim Weatherall (UC Irvine): UC Irvine
- Caleb Cohoe: Metropolitan State University, Denver
- Jada Strabbing: Fordham University
- Giovanni Valente (Maryland): University of Pittsburgh
- Yuichiro Kitajima (Hokkaido): Nihon University
- David J. Baker*: University of Michigan
- Lara Buchak: UC Berkeley
- Tracy Lupher (Texas): James Madison University
- Antony Eagle: Oxford University, University of Adelaide

Graduate seminars

- Philosophy of space and time (with D. Hogan)
- Logical philosophy of science
- Foundations of mathematics: set theory vs. category theory (with J. Burgess)
- Categorical logic and topos theory
- 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)

Students in Princeton's PhD program earn "units of credit" by writing papers under the supervision of some member of the faculty. I have advised unit work on a number of topics including general philosophy of science, philosophy of physics, philosophy of religion, and philosophical logic.

Senior theses advised: Since 2001, I have advised between one and five undergraduate theses per

year — for the mathematics, philosophy, and physics departments. Besides advising theses in my areas of expertise, I have also advised theses in metaphysics, philosophy of mind, philosophy of religion, philosophy of biology, philosophy of medicine, Kierkegaard, and pragmatism.

Undergraduate courses and seminars

- Kierkegaard, Concluding Unscientific Postscript
- Philosophy of Science
- History of Analytic Philosophy 1900–1950
- Philosophy of Mathematics
- Category Theory (math-phil)
- Advanced Logic (math-phil)
- Intermediate Logic
- Philosophical Logic
- Philosophy of Physics
- Philosophy of Religion
- Introductory Logic
- History of Modern Philosophy

Administrative experience

- Director of Graduate Studies, Philosophy Department, 2007–08
- Princeton University Research Board, 2007–08, 2009-11, 2016–17

Service to the university and the profession

PhilPapers.org area editor, philosophy of physical science 2011–
Organizer: Foundations of Quantum Theory Conference. Nagoya, Japan. March 2015
Organizer: Irvine-Pittsburgh-Princeton conference series on the foundations of physics, 2013–2015
Organizer: Symposium on categorical perspectives in the philosophy of physics. Philosophy of Science Association Meeting, 2010
Organizer: Conference on understanding quantum mechanics through mathematical innovation. Princeton, Oct 2007
Organizer: Conference on equivalent theories in science and metaphysics. Princeton, Mar 2015
Program Committee: The Semantics of Scientific Theories 2016. LMU Munich.
Program Committee: Philosophy of Science Association Meeting 2006.
Dissertation examiner: University of Texas (philosophy) 2007; University of Utrecht (foundations of science) 2009; University of Nijmegen (mathematics) 2013; Carnegie Mellon University (philosophy) 2013; University of Aberdeen (theology) 2014
Reviewer for senior faculty hiring and promotions: Boston University, Columbia University, Drexel University, Georgetown University, London School of Economics, National Technical University of Athens, NYU, Oxford University, Rutgers University, St. Olaf College, Stanford, UC Irvine, University of Chicago, University of Michigan, University of Pittsburgh, University of Southern California, University of Washington, University of Waterloo, Yale University
Academic Advisory Board: National Speech and Debate Association, 2015–16.
Co-organizer of Oxford-Princeton partnership in Philosophy of Physics, annual workshop, and student exchange 2001–2007

Invited participant in Princeton Council of the Humanities, philosophy of time group, 2003–04
Invited participant in New York Institute of Philosophy, cosmology and religion discussion group, 2008
Board of editors for Science, Religion and Culture; International Journal of Quantum Foundations.
Referee for:

Analysis, *Annals of Physics*, *Annals of Pure and Applied Logic*, *Australasian Journal of Philosophy*, *British Journal for the Philosophy of Science*, *Canadian Journal of Philosophy*, *Christian Scholars Review*, *Communications in Mathematical Physics*, *Erkenntnis*, *Foundations of Physics*, *International Studies in the Philosophy of Science*, *Journal for General Philosophy of Science*, *Journal of Mathematical Physics*, *Journal of Physics A*, *Notre Dame Journal of Formal Logic*, *Philosopher's Imprint*, *Philosophical Studies*, *Philosophy of Science*, *Philosophical Transactions of the Royal Society*, *Physics Letters A*, *Physical Review A*, *Physical Review Letters*, *Ratio*, *Reviews of Mathematical Physics*, *Science and Christian Belief*, *Studia Logica*, *Studies in History and Philosophy of Science*, *Studies in History and Philosophy of Modern Physics*, *Theoria*, Quantum Physics and Logic (QPL 2011), National Science Foundation (USA), Engineering and Science Research Council (UK), Israel Science Foundation, Netherlands Organisation for Scientific Research (NWO), Social Sciences and Humanities Research Council of Canada, L'agence Nationale de la Recherche (= national science foundation of France), Austrian Science Fund (FWF), The German-Israeli Foundation for Scientific Research and Development, National Research, Development and Innovation Office of Hungary, The Leverhulme Trust, Elsevier Scientific Publishers, Hackett Publishing, John Templeton Foundation, Templeton World Charity Foundation, Oxford University Press, Oneworld Publications, Princeton University Press, Springer Verlag, Wiley-Blackwell, Yale University Press.

Service to the Philosophy Department at Princeton:

director of PhD placement, 2009–12, 2016–17
director of colloquium committee, 2010–11, 2016–17
graduate language examiner (French, German) 2001–
computer committee 2004–06, 2014–15
curriculum committee 2001–03, 2004–06, 2007–08
graduate admissions committee 2001–02, 2003–06, 2007–08, 2009–11, 2013–14
library committee 2009–10

Additional Languages

German, French (reading)

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