

# Michael E. Miller

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**Employment**      Assistant Professor, Department of Philosophy and Institute for the History and Philosophy of Science and Technology, University of Toronto, 2017 -

**Education**      Ph.D., History and Philosophy of Science, University of Pittsburgh, 2017  
M.A., Philosophical Foundations of Physics, Columbia University, 2011  
B.A. with Honors, Physics and Philosophy, University of Chicago, 2008

**Interests**      AOS: Philosophy of Physics, Philosophy of Science, History of Physics  
AOC: Philosophy of Economics, Logic, Metaphysics

**Articles**      (Forthcoming) Haag's Theorem, Apparent Inconsistency, and the Empirical Adequacy of Quantum Field Theory, *The British Journal for the Philosophy of Science*.

(2015) The Origins of Schwinger's Euclidean Green's Functions, *Studies in the History and Philosophy of Modern Physics*, 50:5-12.

(2010) Readiness of the ATLAS Tile Calorimeter for LHC Collisions, *European Physics Journal C* 70:1193-1236 (with the ATLAS Collaboration).

**Reviews**      (Forthcoming) What, if anything, does quantum field theory explain?, *Metascience*. Review of Jonathan Bain: CPT invariance and the spin-statistics connection. Oxford University Press.

**In Preparation**      Mathematical Structure and Empirical Content (Under review)

On the common structure of perturbative and axiomatic quantum field theory in Borel summable models (In preparation)

Why are there ultraviolet divergences at all? (In preparation)

**Talks**

- “On the common structure of perturbative and axiomatic field theory”
- *Canadian Society for the History and Philosophy of Science*, Ryerson University, May 2017.
- “Is the empirical content of quantum field theory inexact?”
- The University of Illinois at Chicago, May 2017.
- “Three obstacles to the interpretation of quantum field theory”
- The University of Toronto, January 2017.
  - California Institute of Technology, February 2017.
- “Why are there ultraviolet divergences at all?”
- *Philosophy of Science Association Meeting*, Atlanta, November 2016.
- “The significance of perturbative finiteness”
- *Space and Time After Quantum Gravity Summer Institute*, Williams Bay, June 2016.
- “State-space semantics for divergent perturbation theory”
- *Philosophy of Science Working Group*, University of Michigan, April 2016.
- “Mathematical structure and the meaning of ‘quantum field’ ”
- *Sigma Club*, London School of Economics, October 2015.
  - *Munich Center for Mathematical Philosophy*, Ludwig-Maximilians-Universität, November 2015.
- “Exact models and physical semantics”
- *British Society for Philosophy of Science Annual Meeting*, University of Manchester, July 2015.
- “The underdetermination of field theoretic structure”
- *Philosophy of Logic, Math, and Physics Graduate Conference*, University of Western Ontario, June 2015.
  - *IPP Conference on the Mathematical and Conceptual Foundations of Physics*, Princeton University, March 2015.
  - *NY/NJ Philosophy of Science Group*, Columbia University, December 2014.
- “The origins of Schwinger’s euclidean Green’s functions”
- *History of Science Society Meeting*, Chicago, November 2014.
- “Haag’s theorem and successful applications of scattering theory”
- *Philosophy of Science Association Meeting*, Chicago, November 2014.
  - *IPP Conference on the Mathematical and Conceptual Foundations of Physics*, University of California - Irvine, March 2014.

**Invited  
Commentary**

- Invited Discussant, “Big questions: some fundamental problems in physics”
- *20th annual Seven Pines Symposium*, Stillwater, May 2016.
- “What Explains the Spin-Statistics Connection?” (Jonathan Bain)
- *APA Pacific Division Meeting*, San Francisco, April 2016.

“Is the Renormalization Group Explanation a Non-Causal Explanation?” (Min Tang)  
 ◦ *Society for the Metaphysics of Science*, Rutgers, September 2015.

“Why (It Seems) We Cannot Influence the Past” (Alison Fernandes)  
 ◦ *Pitt-CMU Graduate Conference*, University of Pittsburgh, April 2012.

## Teaching

*University of Toronto:*

Spring 2017 · Structuralism (graduate seminar)  
 Spring 2017 · Philosophy of Physics  
 Fall 2017 · Intermediate Logic  
 Fall 2017 · Science and Values

*University of Pittsburgh:*

Spring 2017 · Myth and Science  
 Fall 2016 · Philosophy of 20th Century Physics  
 Summer 2016 · Brackenridge Summer Research Fellowship Program  
 Spring 2015 · Philosophy of 20th Century Physics  
 Fall 2014 · Principles of Scientific Reasoning, instructor

## Awards and Grants

(2017) SIG Grant, University of Toronto  
 (2016) NSF Travel Grant, *National Science Foundation*  
 (2016) Space and Time After Quantum Gravity Summer Institute, *University of Geneva and the University of Illinois at Chicago*  
 (2015) Robert K. Clifton Memorial Prize, *University of Western Ontario*  
 (2015) Junior Fellowship, *Munich Center for Mathematical Philosophy*  
 (2015) Nominee for Elizabeth Baranger Teaching Award, *University of Pittsburgh*  
 (2014) PSA/HSS Travel Grant, *National Science Foundation*  
 (2013, 2015, 2016) Wesley Salmon Fund Grant, *University of Pittsburgh*  
 (2013) Institute for the Philosophy of Cosmology, *University of California - Santa Cruz*  
 (2009-2011) Joint Philosophy & Physics Departmental Scholarship, *Columbia University*  
 (2004-2008) Illinois Space Consortium Grant, *NASA*

## Service

*Departmental Service:*

(2014-2015) Pittsburgh HPS Graduate Student Representative to the Faculty  
 (2014-2015) Manager of Pittsburgh HPS website

*PhilSci-Archive:*

(2012-2013, 2014-2015, 2016-2017) Academic manager of the archive  
 (2013-2014, 2015-2016) Technical consultant to the archive

*Conference organization:*

(2014) Co-organizer of The Physics of Emergence (with Robert Batterman and Julia Bursten)  
 (2013) Co-organizer of Irvine-Princeton-Pittsburgh Conference on the Mathematical and Conceptual Foundations of Physics (with Hans Halvorson, Giovanni Valente, and James Weatherall)

*Journal Referee:* Philosophy of Science (2014, 2015, 2016), Studies in the History and Philosophy of Modern Physics (2015, 2016), The Journal of Physical Mathematics (2015), The British Journal for the Philosophy of Science (2017), International Studies in the Philosophy of Science (2017), Routledge (2017)

*Conference Referee:* Irvine-Princeton-Pittsburgh Conference on the Mathematical and Conceptual Foundations of Physics (2013, 2014, 2015, 2016), Pitt-CMU Graduate Conference (2012, 2014)

**Affiliations**

American Philosophical Association, Philosophy of Science Association, British Society for Philosophy of Science, History of Science Society, Canadian Society for the History and Philosophy of Science

**Scientific Research**

(2008-2009) Staff Researcher, The ATLAS Experiment, *CERN*

(2004-2006, 2007-2008) Research Assistant, Transition Radiation Array for Cosmic Energetic Radiation, *Enrico Fermi Institute*