

James Owen Weatherall

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Areas of Specialty

Philosophy of physics. Philosophy of space and time. Philosophy of science. Mathematical physics.

Areas of Competence

Category theory. Philosophy of mathematics. Philosophy of economics. History of philosophy of science.

Academic Appointments and Affiliations

University of California, Irvine

Professor of Logic and Philosophy of Science, 2016–Present.

Campuswide Honors Faculty, 2016–Present.

Member, Institute for Mathematical Behavioral Science, 2012–Present.

Associate Professor of Logic and Philosophy of Science, 2014–2016.

Assistant Professor of Logic and Philosophy of Science, 2012–2014.

Instructor/Graduate Teaching Associate, Spring 2011.

Visiting Positions

Visiting Fellow, Research School of Social Sciences, Australian National University, Summer 2017 [scheduled].

Visiting Fellow, Clare Hall, Cambridge University, Summer 2016.

Visitor, Center for Philosophy of Natural and Social Science, London School of Economics, Summer 2016.

Visiting Fellow, Center for Philosophy of Science, University of Pittsburgh, Fall 2015.

Visiting Fellow, Munich Center for Mathematical Philosophy, Ludwig-Maximilians Universität, July 2013; August 2018 [scheduled].

Education

Ph.D. Philosophy (LPS), *University of California, Irvine*, 2012.

Philosophy of physics emphasis. Dissertation: “Mass and Motion: Topics at the Interface of General Relativity and Newtonian Gravitation”; committee: David B. Malament (UCI, chair), Jeffrey Barrett (UCI), P. Kyle Stanford (UCI).

M.F.A. Creative Writing, *Fairleigh Dickinson University*, 2010.

Craft and form thesis: “The Scientific Image: On the uses of technical language in fiction”; creative thesis: excerpt from novel, “A Thirst for Salt”; committee: David Grand (FDU, chair), Martin Donoff (FDU), Ellen Akins (FDU).

Ph.D. Mathematics and Physics, *Stevens Institute of Technology*, 2009.

Dissertation: “Quantum Control of Linear Susceptibility in Five Level Atoms via Dressed Interacting Ground States, With a Focus on Group Velocity Control”; committee: Christopher Search (Stevens, chair), Knut Stamnes (Stevens), Charles Suffel (Stevens), Kurt Becker (NYU).

A.M. Physics, *Harvard University*, 2005.

A.B. Physics and Philosophy, *Harvard College*, 2005.

Cum laude in field; High Honors; honors thesis (*Summa cum laude* minus): “Effective field theory and the pragmatics of explanation”; committee: Peter Galison (Harvard, chair), Howard Georgi (Harvard), Ned Hall (MIT). Citation in French.

Awards, Grants, and Honors

FQXi Mini Grant, “Workshop on Bohrification,” \$5000, 2016.

Elected Life Member, Clare Hall, University of Cambridge, 2016.

John Templeton Foundation Exploratory Grant, “Laws, Methods, and Minds in Cosmology,” co-PI w/ J. B. Manchak and Chris Smeenk (PI, Western University), \$205,834, 2016–2017.

FQXi Mini Grant, “Irvine-Munich Workshop on the Foundations of Classical and Quantum Field Theories,” \$5,000, 2014.

NEH Grant # AQ51039, “What is Time? Perspectives from Physics, Philosophy, Fiction, and Film,” NEH Enduring Questions Course Development Grant, \$21,991, 2014–2017.

NSF Grant # 1331126, “A Theoretical Study of the Conceptual, Mathematical, and Explanatory Interconnections at the Foundations of Classical Field Theories,” NSF Science and Technology Studies Research Grant, \$221,590, 2013–2017.

NSF Grant # 1328172, “Comprehending and Regulating Financial Crises,” co-PI w/ N. Bandelj (PI), J. Elyachar, and G. Richardson, NSF Interdisciplinary Behavioral and Social Science Research Team Exploratory Grant, \$249,928, 2013–2016.

NSF Grant # 1331178, “Using Topology to Answer Philosophical Questions About General Relativity,” NSF Doctoral Dissertation Improvement Grant for Samuel Fletcher, \$11,669, 2013–2014.

DECADE Mentor Graduate Diversity Award, co-PI w/ L. Chavez, C. Chubb, and A. Hironaka, Diverse Educational Community and Doctoral Experience (DECADE) Program, Graduate Division, University of California, Irvine, \$30,000, 2013–2014.

UCI Alumni Association Lauds and Laurels Outstanding Graduate Student Award, University of California, Irvine, 2012.

Robert K. Clifton Memorial Book Prize, for “On the status of the geodesic principle in Newtonian and relativistic physics,” University of Western Ontario, 2011.

Justine Lambert Graduate Prize in the Foundations of Science, for “The Motion of a Body in Newtonian Theories,” University of California, Irvine, 2010.

Collection coordinator, “Everett Papers Project,” supported under an NSF grant awarded to Jeffrey A. Barret, 2010–2011.

Social Science Merit Fellowship, University of California, Irvine, 2007–2012.

Stevens Fellowship, Stevens Institute of Technology, 2007–2009.

Graduate Assistantship/Assistant Editorship of *The Literary Review*, Fairleigh Dickinson University, 2007.

Thomas T. Hoopes Prize for Outstanding Undergraduate Research, for “Effective Field Theories and the Pragmatics of Explanation,” Harvard College, 2005.

Harvard College Research Program Grant, for philosophy of science, Harvard College, 2004.

Member, Signet Society of Arts & Letters, a Harvard College honorary society for the humanities.

Publications

Books and Edited Collections

- B5. *Void: The Strange Physics of Nothing*. New Haven, CT: Yale University Press (2016).
Also published in China with Cheers Books [Simplified Chinese trans.]; in Italy with Bollati Boringhieri Editore [Italian trans.]; and in Turkey with Buzdagi Yayinevi [Turkish translation].
- B4. *Mathematical Depth*, edited with M. Ernst, J. Heis, P. Maddy, and M. McNulty. Special Issue of *Philosophia Mathematica* **23**(2) (2015).
- B3. *Relativistic Causality*, edited with G. Valente. Special Issue of *Studies in History and Philosophy of Modern Physics* **48B** (2014).
- B2. *The Physics of Wall Street: A Brief History of Predicting the Unpredictable*. Boston, MA: Houghton Mifflin Harcourt (2013).
A *New York Times* Editors' Choice and Bestseller. Also published in English in the U.K., Europe, and the Commonwealth (except ANZ) by Short Books; in Australia and New Zealand by Scribe Publications; in Brazil [Portuguese trans.] by Elsevier; in China [Simplified Chinese trans.] by Cheers Books; in Japan [Japanese trans.] by Hayakawa; in Korea [Korean trans.] by Business Map; in Taiwan [Chinese trans.] by Commonwealth Publishers; in Finland [Finnish trans.] by Terra Cognita Oy; in Russia [Russian trans.] by Mann, Ivanov, and Ferber; and in Spain, Latin America, and other Spanish speaking territories [Spanish trans.] by Ariel/Planeta.
- B1. *The Everett Papers Project*, edited with J. Barrett and P. Byrne. *UCISpace@The Libraries*. Available at: <http://ucispace.lib.uci.edu/handle/10575/1060> (2011).

Peer Reviewed Articles and Book Chapters

- A28. "Market Crashes as Critical Phenomena? Explanation, Idealization, and Universality in Econophysics," with J. Jhun and P. Palacios. Forthcoming in *Synthese*.
- A27. "Conservation, Inertia, and Spacetime Geometry." Forthcoming in *Studies in History and Philosophy of Modern Physics*.
- A26. "A Categorical Equivalence between Generalized Holonomy Maps on a Connected Manifold and Principal Connections on Bundles over that Manifold," with S. Rosenstock. *Journal of Mathematical Physics* **57**(10), 102902 (2016).
- A25. "Morals and Emotions of Money," with N. Bandelj, J. Elyachar, J. Kim, M. McBride, and Z. Tufail. Forthcoming in *Money Talks*. N. Bandelj, F. Wherry, and V. Zelizer, eds. Princeton: Princeton University Press.
- A24. "Understanding Gauge." *Philosophy of Science* **83**(5), 1039–1049 (2016).
- A23. "On Einstein Algebras and Relativistic Spacetimes," with S. Rosenstock and T. Barrett. *Studies in History and Philosophy of Modern Physics* **52B**, 309–316 (2015).
- A22. "Fiber bundles, Yang-Mills theory, and General Relativity." *Synthese* **193**(8), 2389–2425 (2016).
- A21. "Category Theory and the Foundations of Classical Field Theories." Forthcoming in *Categories for the Working Philosopher*. E. Landry ed. Oxford: Oxford University Press.
- A20. "Are Newtonian gravitation and geometrized Newtonian gravitation theoretically equivalent?" *Erkenntnis* **81**(5), 1073–1091 (2016).
- A19. "Maxwell-Huygens, Newton-Cartan, and Saunders-Knox Spacetimes." *Philosophy of Science* **83**(1), 82–92 (2016).
- A18. "Regarding the 'Hole Argument'." Forthcoming in *The British Journal for Philosophy of Science*.
- A17. "Comprehending and Regulating Financial Crises: A Critical Interdisciplinary Approach," with N. Bandelj, J. Elyachar, and G. Richardson. *Perspectives on Science* **24**(4), 443–473 (2016).
- A16. "Collective belief and the string theory community," with M. Gilbert. *The Epistemic Life of Groups: Essays in the Epistemology of Collectives*. M. Brady and M. Fricker eds. Oxford, UK: Oxford University Press (2016).

- A15. “On G. E. Moore’s ‘Proof of an External World’.” Forthcoming in *Pacific Philosophical Quarterly*.
- A14. “Against Dogma: On Superluminal Propagation in Classical Electromagnetism.” *Studies in History and Philosophy of Modern Physics* **48B**, 109–123 (2014).
- A13. “The Geometry of Conventionality,” with J. Manchak. *Philosophy of Science* **81**(2), 233–247 (2014).
- A12. “What is a Singularity in Geometrized Newtonian Gravitation?” *Philosophy of Science* **81**(5), 1077–1089 (2014).
- A11. “Inertial motion, explanation, and the foundations of classical space-time theories.” Forthcoming in *Towards a Theory of Spacetime Theories*. D. Lehmkuhl, G. Schiemann, and E. Scholz eds. Boston, MA: Birkhäuser (2017).
- A10. “The scope and generality of Bell-type theorems.” *Foundations of Physics* **43**(9), 1153–1169 (2013).
- A9. “A Brief Remark on Energy Conditions and the Geroch-Jang Theorem.” *Foundations of Physics* **42**(2), 209–214 (2012).
- A8. “On the status of the geodesic principle in Newtonian and relativistic physics.” *Studies in History and Philosophy of Modern Physics* **42**(4), 276–281 (2011).
- A7. “On (Some) Explanations in Physics.” *Philosophy of Science* **78**(3), 421–447 (2011).
- A6. “The Motion of a Body in Newtonian Theories.” *Journal of Mathematical Physics* **52**(3), 032502 (2011).
- A5. “Index of refraction engineering in five level DIGS atoms,” with S. Sagona-Stophel and C. Search. *Optics Letters* **36**(16), 3130 (2011).
- A4. “Lossless anomalous dispersion and an inversionless gain doublet via dressed interacting ground states,” with C. Search. *Phys. Rev. A* **81**, 023806 (2010).
- A3. “Electromagnetically Induced Transparency in a Double Well Atomic Josephson Junction,” with C. Search. *Acta Phys. Pol.* **116**(4) 455–459 (2009).
- A2. “Quantum control of dispersion in electromagnetically induced transparency via interacting dressed ground states,” with C. Search. *Phys. Rev. A* **78**, 053802 (2008).
- A1. “Quantum control of electromagnetically induced transparency dispersion via atomic tunneling in a double-well Bose-Einstein condensate,” with C. Search and M. Jääskeläinen. *Phys. Rev. A* **78**, 013830 (2008).
Reprinted in *Virtual Journal of Quantum Information* **8**(8), (2008).

Book Reviews

- R3. “Black Holes, Black Scholes, and Prairie Voles: An Essay Review of *Simulation and Similarity*, by Michael Weisberg,” with C. O’Connor. *Philosophy of Science* **83**(4), 613–626 (2016).
- R2. Review of *Interpreting Physical Theories*, by L. Ruetsche. *Philosophical Review* **124**(2), 275–278 (2015).
- R1. Review of *The Oxford Handbook of Philosophy of Physics*, edited by R. Batterman. *Notre Dame Philosophical Reviews* (2013).

Short Reviews, Commentary, and Other Publications

- O23. “Is Quantum Theory About Reality or What We Know?” *Nautilus: Facts so Romantic*. Published online 24 April 2017.
- O22. “Why Rotation Makes No Sense Sometimes.” *Nautilus: Facts so Romantic*. Published online 2 January 2017.
- O21. “Vera Rubin and the Discovery of Dark Matter.” *Yale Books Unbound* (Yale University Press Blog). Published online 20 December 2016.
- O20. “Why the Flash Crash Really Matters,” with C. Clearfield. *Nautilus* Issue 23, Chapter 4. Published online 23 April 2015.

- O19. Foreword / Afterword to *Mathematical Depth*, with M. Ernst, J. Heis, P. Maddy, and M. McNulty. *Philosophia Mathematica* **23**(2) (2015). (Peer reviewed editorial commentary.)
- O18. “When Wall Street does the math, it can get it wrong.” *Orange County Register*. 3 June 2013.
- O17. “You can know the future.” *Australian Financial Review*. 23 March 2013, 58.
- O16. “Fisics and Phynancs.” The Back Page. *APS News*. March 2013.
- O15. “It is not the maths that causes crises but the trust we put in it.” *Financial Times*. 15 February 2013, 11.
- O14. “Evil Wall Street tricks can be used for good.” *USA Today*. 13 February 2013.
- O13. “Black swans are difficult to predict but we still need maths in finance.” *City A.M.* 11 February 2013. (Excerpt from *The Physics of Wall Street*.)
- O12. “The ‘Pioneer Anomaly’ that Threatened to Upend Physics.” *The Boston Globe*. 2 September 2012.
- O11. “The Higgs Boson ‘Nightmare Scenario’: What if the biggest new discovery in physics isn’t a beginning, but an end?” *The Boston Globe*. 22 July 2012, K3.
- O10. “Commentary on *General Relativity from A to B* by Robert Geroch.” *Humana.menta* **13** (2010).
- O9. “A Geometric Theory of Everything,” with A. Garrett Lisi. *Scientific American*. December 2010. Reprinted in *Secrets of the Universe: Past, Present, Future*, L. Billings, ed. Special Issue of *Scientific American*. August 2014.
- O8. “Dark Flow Revealed.” *Popular Science*. October 2009.
- O7. “The Accidental Particle: They’re turning on the Large Hadron Collider. Don’t expect the Higgs boson to show up.” *Slate* (<http://www.slate.com>). September 9, 2008.
- O6. “No Strings Attached.” *Men’s Journal*. June 2008.
- O5. “The Littlest Big Bang.” *Popular Science*. May 2008.
- O4. Editor’s Choice of *Overture* by Yael Goldstein. *The Literary Review*. Summer 2007
- O3. “Quantum Scoop: The Holy Grail of Particle Physics May Already Have Been Found.” *Slate* (<http://www.slate.com>). June 4, 2007.
- O2. Editor’s Choice of *Stories in the Old Style* by Al Sim. *The Literary Review*. Fall 2006.
- O1. Editor’s Choice of *Branwell* by Douglas Martin. *The Literary Review*. Summer 2006.

Selected Works in Progress

Books and Edited Collections

- WP1. *The Eclipse of Truth: How Your Friends Affect What You Think You Know—And Why It Matters in an Age of Alternative Facts*, with C. O’Connor. Under contract with Yale University Press.
- WP2. *The Geometrical Foundations of Classical Field Theory*.
- WP3. *Space, Time, and Geometry from Newton to Einstein, feat. Maxwell*, lecture notes based on 2016 MCMP Summer School on Mathematical Philosophy.

Articles and Book Chapters

- WP4. “The Motion of Small Bodies in Space-time,” with R. Geroch (in submission; draft available).
- WP5. “The Peculiar Logic of the Black-Scholes Model” (in submission; draft available).
- WP6. “On Gravitational Energy in Newtonian Theories,” with Neil Dewar (in submission; draft available).
- WP7. “A Brief Comment on Maxwell(/Newton)[-Huygens] Spacetime” (in submission; draft available).
- WP8. “Classical Spacetime Structure” (invited for the *Routledge Companion to Philosophy of Physics*, E. Knox & A. Wilson eds.).

- WP9. “Some Philosophical Prehistory of the Earman-Norton Hole Argument” (invited for a special issue of *Foundations of Physics* on the hole argument, B. Roberts & J. Weatherall eds.).
- WP10. “On Nonregular Representations in Quantum Mechanics,” with B. Feintzeig, J. B. (Le)Manchak, and S. Rosenstock.
- WP11. “The Geometry of the ‘Gauge Argument’,” with B. Feintzeig.
- WP12. “General Relativity in Two Dimensions,” with M. Schneider, S. Fletcher, and J. B. Manchak.
- WP13. “On Stuff: The Field Concept in Classical and Quantum Physics.”

Invited Talks

- IT72. “The Physics of Wall Street”. Perimeter Institute Public Lecture Series. Perimeter Institute. Toronto, ON. October 2017 [scheduled].
- IT71. TBD (keynote lecture). Thinking about Space and Time: 100 Years of Applying and Interpreting General Relativity. Bern, Switzerland. September 2017 [scheduled].
- IT70. TBD. School of Philosophy. Australian National University. Canberra, Australia. August 2017 [scheduled].
- IT69. TBD. Department of Physics. University of Auckland. Auckland, New Zealand. August 2017 [scheduled].
- IT68. “Conservation, Inertia, and Spacetime Geometry”. New Directions in the Foundations of Physics. Tarquinia, Italy. May 2017.
- IT67. “On Stuff”. Department of Philosophy. University of California. Davis, CA. March 2017.
- IT66. “The Physics of Wall Street”. Perimeter Institute Public Lecture Series. Perimeter Institute. Waterloo, ON. February 2017.
- IT65. “On Stuff”. Department of Philosophy. University of Minnesota. Minneapolis, MN. December 2016.
- IT64. “On Stuff”. Philosophy of Physics Seminar. Oxford University. Oxford, UK. November 2016.
- IT63. “What Makes Econophysics Distinctive?”. CamPoS (Cambridge Philosophy of Science) Seminar. Cambridge University. Cambridge, UK. November 2016.
- IT62. “The Peculiar Logic of the Black-Scholes Model”. History and Philosophy of Science Reading Group. Cambridge University. Cambridge, UK. November 2016.
- IT61. “Structure and Equivalence in Physics” (two lectures). Master Class. Cambridge University. Cambridge, UK. November 2016.
- IT60. “On Stuff”. Sigma Club. London School of Economics. London, UK. September 2016.
- IT59. “Theoretical Structure and Theoretical Equivalence”. Workshop on Equivalence of Theories. University of Salzburg. Salzburg, Austria. September 2016.
- IT58. Space, Time, and Geometry from Newton to Einstein, feat. Maxwell [six lecture series]. MCMF Summer School on Mathematical Philosophy for Female Students. Munich Center for Mathematical Philosophy. Ludwig-Maximilians Universität. München, Germany. July 2016.
- IT57. “Giving Econophysics a Chance: On the Plausibility of Modeling Financial Crashes as Critical Phase Transitions,” with J. Jhun and P. Palacios. Workshop on Econophysics. Munich Center for Mathematical Philosophy. Ludwig-Maximilians Universität. München, Germany. July 2016. (Delivered by co-authors J. Jhun and P. Palacios.)
- IT56. “This Time It’s Different? Econophysics, from 1900 to Today”. Workshop on Econophysics. Munich Center for Mathematical Philosophy. Ludwig-Maximilians Universität. München, Germany. July 2016.
- IT55. “Some Philosophical Prehistory of the Hole Argument”. The Hole Shebang. Department of Philosophy, Logic, and Scientific Method. London School of Economics. London, UK. July 2016.

- IT54. “Some Philosophical Reflections on Gravitational Waves”. Departments of Physics and Philosophy. Morehead State University. Morehead, KY. April 2016.
- IT53. “The Field Concept in Classical Physics”. Workshop on the Field Concept in Physics. Center for Philosophy of Science. University of Pittsburgh. Pittsburgh, PA. April 2016.
- IT52. “Theoretical Structure and Theoretical Equivalence.” Perimeter Institute. Waterloo, ON. March 2016.
- IT51. “On Stuff”. Instituto de Filosofia y Ciencias de la Complejidad. Santiago, Chile. December 2015.
- IT50. “On Stuff”. Department of Philosophy. Carnegie Mellon University. Pittsburgh, PA. November 2015.
- IT49. “On Stuff”. Center for Philosophy of Science. University of Pittsburgh. Pittsburgh, PA. October 2015.
- IT48. “The Physics of Wall Street.” American Association of Individual Investors, San Diego Chapter. San Diego, CA. April 2015.
- IT47. “Fiber Bundles, Yang-Mills Theory, and General Relativity.” The Irvine-Munich Workshop on the Foundations of Classical and Quantum Field Theories. Munich Center for Mathematical Philosophy. Ludwig-Maximilians Universität. München, Germany. December 2014.
- IT46. “Theoretical Structure and Theoretical Equivalence.” Department of Philosophy. University of California. La Jolla, CA. December 2014.
- IT45. “The Physics of Wall Street.” Department of Physics. Texas Tech University. Lubbock, TX. November 2014.
- IT44. “Inertial Motion, Explanation, and the Foundations of Classical Field Theory.” Department of Philosophy. Texas Tech University. Lubbock, TX. November 2014.
- IT43. “The Physics of Wall Street.” 2014 LiquidNet Institutional Trading Summit (Keynote Speaker). Savannah, GA. November 2014.
- IT42. Panel Discussion on “Bridging the Philosophy / Science Divide,” with C. Lee, S. Mitchell, and E. Sober. Philosophy of Science Association 2014 Biennial Meeting. Chicago, IL. November 2014.
- IT41. “The Physics of Wall Street.” American Association of Individual Investors, Orange County Chapter. Costa Mesa, CA. October 2014.
- IT40. “On Particle and Field Interpretations of Quantum Field Theory.” 18th Annual Seven Pines Symposium. Stillwater, MN. May 2014.
- IT39. “The Physics of Wall Street.” UCI CEO Roundtable Retreat. Napa, CA. May 2014.
- IT38. Panel Discussion on *The Physics of Wall Street*, with D. Grand and R. Steinke. Morris Arts Center. Morristown, NJ. April 2014.
- IT37. “The Physics of Wall Street.” Department of Literature, Language, Writing, and Philosophy. Fairleigh Dickinson University. Madison, NJ. April 2014.
- IT36. “Prediction in General Relativity.” The Foundational Questions Institute (FQXi) 4th International Conference. Vieques, Puerto Rico. January 2014.
- IT35. “Can Newtonian gravitation explain inertial motion?” Department of Philosophy. University of Notre Dame. South Bend, IN. October 2013.
- IT34. Panel Discussion on *The Physics of Wall Street*, with V. Bhansali and E. Thorp. Sage Hill Science Lecture Series. Sage Hill High School. Newport Coast, CA. October 2013.
- IT33. “What is a Scientific Theory? or, How to formalize a scientific theory ...if you’re inclined to do so,” w/ H. Halvorson. Department of Philosophy. Carnegie Mellon University. Pittsburgh, PA. September 2013.
- IT32. “Inertial Motion, Explanation, and the Foundations of Classical Spacetime Theories.” Munich Center for Mathematical Philosophy. Ludwig-Maximilians Universität. München, Germany. July 2013.

- IT31. “Against Dogma: On Superluminal Propagation in Classical Electromagnetism.” Annual Philosophy of Physics Conference. University of Western Ontario. London, ON. May 2013.
- IT30. “The Physics of Wall Street.” Department of Physics & Astronomy. California State University. Long Beach, CA. April 2013.
- IT29. “The Physics of Wall Street.” University Club Spring Forum/Osher Lifelong Learning Institute. University of California. Irvine, CA. April 2013.
- IT28. “The Geometry of Conventionality.” Philosophy of Physics Seminar. Department of History and Philosophy of Science. University of Pittsburgh. Pittsburgh, PA. April 2013.
- IT27. Panel Discussion on *The Physics of Wall Street*, with E. Friedlander, C. McKenna, J. Soll, and P. Mancall. Dornsife College of Letters, Arts, and Sciences. University of Southern California. Los Angeles, CA. March 2013.
- IT26. “The Physics of Wall Street.” Center for Science Writings. Stevens Institute of Technology. Hoboken, NJ. March 2013.
- IT25. “Against Dogma: On Superluminal Propagation in Classical Electromagnetism.” Joint Particle Seminar. Department of Physics & Astronomy. University of California. Irvine, CA. March 2013.
- IT24. “The Physics of Wall Street.” Department of Physics & Astronomy. University of California. Irvine, CA. March 2013.
- IT23. “Physics, Phynance, and Filosophy.” Worth Leading Wealth Advisors Summit. Los Angeles, CA. March 2013.
- IT22. “The Physics of Wall Street.” Anderson School of Management. University of California. Los Angeles, CA. February 2013.
- IT21. “The Physics of Wall Street.” Seattle Town Hall Science Series. Seattle, WA. January 2013.
- IT20. “Can Newtonian gravitation explain inertial motion?” School of Philosophy. University of Southern California. Los Angeles, CA. October 2012.
- IT19. “The Geometry of Conventionality.” Institute for Philosophy. Hungarian Academy of Science. Budapest, Hungary. September 2012. (Delivered by co-author J. Manchak).
- IT18. “Inertial Motion, Explanation, and the Foundations of Classical Spacetime Theories.” New Directions in the Foundations of Physics 2012. Washington, DC. May 2012.
- IT17. “The scope and generality of Bell-type theorems.” Logic and Philosophy of Science Research Group. University of Maryland. College Park, MD. May 2012.
- IT16. “Are Newtonian gravitation and geometrized Newtonian gravitation theoretically equivalent?” Emmy Noether Junior Research Group Workshop. University of Konstanz. Konstanz, Germany. March 2012.
- IT15. “Can Newtonian gravitation explain inertial motion?” Department of Philosophy. Yale University. New Haven, CT. February 2012.
- IT14. “Can Newtonian gravitation explain inertial motion?” Department of Logic and Philosophy of Science. University of California. Irvine, CA. February 2012.
- IT13. “Can Newtonian gravitation explain inertial motion?” Department of Philosophy. University of California. Berkeley, CA. February 2012.
- IT12. “Can Newtonian gravitation explain inertial motion?” Department of Philosophy. University of Western Ontario. London, ON. February 2012.
- IT11. “Can Newtonian gravitation explain inertial motion?” Department of Philosophy. New York University. New York, NY. January 2012.
- IT10. “Can Newtonian gravitation explain inertial motion?” Department of Philosophy. Brown University. Providence, RI. January 2012.
- IT9. “Can Newtonian gravitation explain inertial motion?” Department of Philosophy. Barnard College. New York, NY. January 2012.

- IT8. “Can Newtonian gravitation explain inertial motion?” Department of Philosophy. University of Texas. Austin, TX. January 2012.
- IT7. “Can Newtonian gravitation explain inertial motion?” Department of Philosophy. University of Chicago. Chicago, IL. January 2012.
- IT6. “Are Newtonian gravitation and geometrized Newtonian gravitation theoretically equivalent?” Southern California Philosophy of Physics Group. University of California. Irvine, CA. December 2011.
- IT5. “On the status of the geodesic principle in Newtonian and relativistic physics.” Center for Philosophy of Science. University of Pittsburgh. Pittsburgh, PA. October 2011.
- IT4. “The scope and generality of Bell-type theorems.” Southern California Philosophy of Physics Group. University of California. Irvine, CA. May 2011.
- IT3. “On the status of the geodesic principle in Newtonian and relativistic physics.” Towards a theory of spacetime theories. Bergische Universität Wuppertal. Wuppertal, Germany. July 2010.
- IT2. “On (Some) Explanations in Physics.” Southern California Philosophy of Physics Group. University of California. Irvine, CA. May 2010.
- IT1. “On the status of the geodesic principle in Newtonian and relativistic physics.” LARSIM colloquium series. CEA-Saclay. Paris, France. February 2010.

Other Talks and Poster Presentations

- OT16. “The Peculiar Logic of the Black-Scholes Formula.” Philosophy of Science Association 2016 Biennial Meeting. Symposium: “How are economic models used (and how should they be)?” Atlanta, GA. November 2016.
- OT15. “Gravitational Energy and a Weyl-like Tensor in Geometrized Newtonian Gravitation.” Foundations of Physics 2016: The 18th UK and European Meeting. London School of Economics. London, UK. July 2016. (Contributed talk.)
- OT14. “New Work on Equations of Motion.” Eight Quadrennial International Fellows Conference. Center for Philosophy of Science, University of Pittsburgh. Lund, Sweden. July 2016. (Contributed talk.)
- OT13. “Giving Econophysics a Chance: On the Plausibility of Modeling Financial Crashes as Critical Phase Transitions,” with J. Jhun and P. Palacios. Workshop on Infinite Idealizations in Science. Munich Center for Mathematical Philosophy. Ludwig-Maximilians Universität. München, Germany. June 2016. (Contributed talk; delivered by co-author P. Palacios.)
- OT12. “Some Philosophical Prehistory of the Hole Argument.” Fourth International Conference on the Nature and Ontology of Spacetime. Minkowski Institute for Foundational Studies. Varna, Bulgaria. May 2016. (Contributed talk.)
- OT11. “Understanding Gauge.” Second International Conference on Logic, Relativity and Beyond. Alfréd Rényi Institute of Mathematics, Hungarian Academy of Sciences. Budapest, Hungary. August 2015. (Contributed talk.)
- OT10. “On Einstein Algebras and General Relativity.” Second International Conference on Logic, Relativity and Beyond. Alfréd Rényi Institute of Mathematics, Hungarian Academy of Sciences. Budapest, Hungary. August 2015. (Contributed talk, delivered by co-author S. Rosenstock.)
- OT9. “Understanding Gauge.” Philosophy of Science Association 2014 Biennial Meeting. Symposium: “Formal Methods in Philosophy of Science.” Chicago, IL. November 2014. (Symposium contribution.)
- OT8. “Science and Fake Science in Fiction.” Association of Writers and Writing Programs 2014 Annual Meeting. Seattle, WA. February 2014. (Part of a panel discussion with R. Steinke, H. L. Hix, and D. Grand.)
- OT7. “The Geometry of Conventionality.” Foundations of Physics 2013: The 17th UK and European Meeting. Ludwig-Maximilians Universität. München, Germany. July 2013. (Contributed talk jointly delivered with co-author J. Manchak.)

- OT6. “What is a singularity in geometrized Newtonian gravitation?” Philosophy of Science Association 2012 Biennial Meeting. Symposium: “New Horizons for Singularities in Classical Spacetime Theories.” San Diego, CA. November 2012. (Symposium contribution.)
- OT5. “On the status of the geodesic principle in Newtonian and relativistic physics.” Logic, Mathematics, and Physics Graduate Conference. University of Western Ontario. London, ON. May 2011. (Contributed talk.)
- OT4. “Collective belief in the string theory community.” Objectivity in Science. University of British Columbia. Vancouver, BC. June 2010 (Contributed talk.)
- OT3. “Quantum control of dispersion in EIT via interacting dressed ground states.” 21st International Conference on Atomic Physics. University of Connecticut. Storrs, CT. July 2008. (Poster presentation.)
- OT2. “Quantum control of EIT dispersion via atomic tunneling in a double-well Bose-Einstein condensate.” American Physical Society March Meeting. New Orleans, LA. March 2008. (Contributed talk.)
- OT1. “Ultra-Slow Light and Coherent Control using EIT in a Double-Well Atomic Condensate.” Particles, Atoms, and Qubits 2007. The Royal Society of London and Imperial College. London, UK. September 2007. (Poster presentation.)

Selected Television, Radio, and Print Media Appearances

- Moncrieff, Sean. “Void: The Strange Physics of Nothing.” *The Moncrieff Show*. Newstalk 206-108FM (Irish Talk Radio). 22 March 2017. (10 min. radio interview.)
- Engster, Jim. “Void: The Strange Physics of Nothing.” *The Jim Engster Show*. Louisiana Radio Network. 27 January 2017. (25 min. radio interview.)
- Sanford, Kiki. “Void: The Strange Physics of Nothing.” *This Week in Science*. KDVS (UC Davis radio station). 25 January 2017. (30 min. radio interview / syndicated podcast.)
- Sumner, Tom. “Void: The Strange Physics of Nothing.” *The Tom Sumner Program*. WFOV (Flint, MI public access radio). 24 January 2017. (30 min. radio interview.)
- Maine, Bill and Joel Williams. “Void: The Strange Physics of Nothing.” *Morning News with Bill and Joel*. WDUN (Atlanta news/talk radio). 20 January 2017. (8 min. radio interview.)
- Joe. “Void: The Strange Physics of Nothing.” *The Joe Show*. KBAI (Seattle talk radio). 18 January 2017. (30 min. radio interview.)
- Lawrence, Warren. “Void: The Strange Physics of Nothing.” *Warren in the Morning*. WKNY (Hudson Valley talk radio). 18 January 2017. (15 min. radio interview.)
- Malone, Jimmy and Chip, Kullik. “Void: The Strange Physics of Nothing.” *The Majic Morning Show*. WMJI (Cleveland radio station). 18 January 2017. (10 min. radio interview.)
- Free, Louie B. “Void: The Strange Physics of Nothing.” *Brainfood from the Heartland*. 18 January 2017. (40 min. syndicated radio interview.)
- Apple, Sam. “John Arnold Made a Fortune at Enron. Now Hes Declared War on Bad Science.” *Wired*. February 2017. (Interviewed for article.)
- Martinez, A. “Void: The Strange Physics Nothing.” *Take Two*. KPCC (Southern California NPR affiliate). 22 December 2016. (7 min. radio interview.)
- McEnroe, Colin. “A Show about Nothing (Really).” *The Colin McEnroe Show*. WNPR (Connecticut NPR affiliate). 6 December 2016. (1 hour radio show, multiple guests.)
- Lynch, Mark. “Void: The Strange Physics of Nothing.” *Inquiry*. WICN (Massachusetts NPR affiliate). 1 December 2016. (30 min. radio/podcast interview.)
- Hope, Bradley. “How computers trawl a sea of data for stock picks.” *The Wall Street Journal*. 1 April 2015. (Interviewed for article.)

Jamison, Leslie. “Giving up the Ghost.” *Harper’s Magazine*. March 2015. (Interviewed for article.)

Murray, Chris. “The Physics of Wall Street.” *Your Financial Editor*. WFMD (Baltimore/DC Talk Radio). 31 May 2014. (20 min. syndicated radio interview.)

Smith, Bill and Chad Slagle. “The Physics of Wall Street.” *Ask the Financial Expert*. 7 February 2014. (15 min. syndicated radio interview.)

D’Arruda, Peter. “The Physics of Wall Street.” *Financial Safari*. 21 December 2013. (10 min. syndicated radio interview.)

Slagle, Chad. “The Physics of Wall Street.” *The Chad Slagle Show*. KMOV Channel 4 (St. Louis CBS affiliate). 22 September 2013. (8 min. television interview.)

Russell, Rob and Curv Mill IV. “The Physics of Wall Street.” *Retirement Rescue Radio*. WHIO (Ohio Talk Radio). 10 August 2013. (1 hour radio interview.)

Manzoor, Sarfraz. “Quants: The Maths Geniuses Running Wall Street.” *The Telegraph*. 23 July 2013. (Syndicated article highlighting *The Physics of Wall Street*; appeared in the *Huffington Post*, *Business Insider*, and elsewhere.)

Goldstein, Doug. “The Physics of Wall Street.” *Goldstein on Gelt*. Israel National Radio. 2 June 2013. (10 min. interview.)

Tignanelli, Drew and Tim Maurer. “The Physics of Wall Street.” *Money, Riches, & Wealth*. WCBM (Baltimore Talk Radio). 22 May 2013. (1 hour radio interview.)

Horgan, John. “Author of The Physics of Wall Street Ponders Strings, Black Swans and a Final Theory of Finance.” *Crosscheck*. ScientificAmerican.com. 1 May 2013. (Interview.)

Swedroe, Larry. “What a physicist can teach us about investing.” *Moneywatch*. CBSNews.com. 18 April 2013. (Commentary on *The Physics of Wall Street*.)

Ryan, Katheryn. “Featured Guest – James Owen Weatherall.” *Nine to Noon*. Radio National New Zealand (New Zealand public radio). 11 April 2013. (33 min. radio interview.)

Maynard. “The Physics of Wall Street.” ABC Newcastle NSW (Australian Public Radio). 10 April 2013. (15 min. radio interview.)

Harford, Tim. “Rich Pickings for Scientists.” *Financial Times Magazine*. 5 April 2013. (Column on *The Physics of Wall Street*.)

Lloyd, Peter. “Could scientists help us avoid another economic crisis?” *PM*. ABC (Australian Public Radio). 3 April 2013. (4 min. radio interview.)

McEnroe, Colin. “Big Data Is Taking Over, Here’s Why Intuition Still Matters.” *The Colin McEnroe Show*. WNPR (Connecticut NPR affiliate). 20 February 2013. (20 min. radio interview.)

Lynch, Russell. “The physics of finance... or in defense of geeks.” *The London Evening Standard*. 14 February 2013. (Newspaper column.)

Jardine, Lisa. “Mathematical modeling with Lisa Jardine.” *Start the Week*. BBC Radio 4. 11 February 2013. (45 min. radio panel discussion.)

Frenkel, Edward. “Don’t Let Economists and Politicians Hack Your Math.” *Slate* (<http://www.slate.com>). 8 February 2013. (Commentary on reception of *The Physics of Wall Street*.)

Jaffe, Chuck. “Big Interview with Jim Weatherall.” *Moneylife*. Dow Jones MarketWatch. 4 February 2013. (12 min. syndicated radio/podcast interview.)

Miller, Kara. “The Physics of Wall Street.” *Innovation Hub*. WGBH (Boston NPR affiliate). 17 January 2013. (20 min. radio interview.)

Reynolds, Ross. “The Physics of Wall Street.” *The Conversation*. KUOW (Seattle NPR affiliate). 14 January 2013. (20 min. radio interview.)

O’Donnell, John. “The Physics of Wall Street.” *Weekend Edition with John O’Donnell*. Power Trading Radio. 11 January 2013. (30 min. filmed interview.)

- Seaman, David. “The Physics of Wall Street.” *The David Seaman Hour*. iTunes Podcasts. 11 January 2013. (Podcast interview.)
- Albrecht, Chris. “The Physics of Wall Street.” *GigaOm Podcast*. GigaOm.com (San Francisco-based technology news site). Recorded 9 January 2013. (Podcast interview.)
- Lopate, Leonard. “The Physics of Wall Street.” *The Leonard Lopate Show*. WNYC (New York NPR affiliate). 4 January 2013. (40 min. radio interview.)
- Young, Jay. “The Physics of Wall Street.” *Daybreak USA*. IRN (syndicated radio network). 2 January 2013. (7 min. radio interview.)
- Lewis, Al. “The Physics of Wall Street.” *Dow Jones Newswires*. 14 December 2012. (Syndicated article; appeared in *The Denver Post*, *Wall Street Journal’s Marketwatch*, *Fox Business*, and elsewhere.)

Courses Taught

At the University of California, Irvine

- SS H1E: **The Good Life** (lower division honors course). Spring 2015; Spring 2016; Spring 2017 [with C. O’Connor].
- LPS/Phil 241 (2 quarters): **Foundations of Classical Field Theory** (graduate lecture course). Fall & Winter 2013–2014; Winter & Spring 2017.
- LPS H125: **What is Time? Perspectives from Physics, Philosophy, Fiction, and Film** (upper division honors seminar). Winter 2015; Winter 2016.
- LPS/Phil 241: **The Philosophy of Howard Stein** (graduate seminar). Winter 2016.
- LPS/Phil 241 (2 quarters): **Foundations of Quantum Field Theory** (graduate lecture course). Winter & Spring 2015.
- LPS/Phil 40: **Scientific Inquiry** (lower division course). Spring 2013; Fall 2013.
- Freshman Seminar: **The Physics of Wall Street**. Spring 2013.
- LPS/Phil 106/206 and Math 189: **Category Theory** (upper division/graduate lecture course). Spring 2013.
- LPS/Phil 241: **Gauge Theories** (graduate seminar). Fall 2013.
- SS H1G: **Naturalized Epistemology** (lower division honors course). Fall 2013 [with J. Barrett].
- LPS 31: **Inductive Logic** (lower division course). Spring 2011.

Professional and Community Service

Editorial Work

- Associate editor**, *Philosophy of Science*, April 2015–Present.
- Managing editor**, *Philosophy of Science*, July 2011–December 2012.

Conference and Workshop Organizing

- Scientific Board**, “Thinking about Space and Time: 100 Years of Applying and Interpreting General Relativity,” University of Bern, September 2017 [scheduled].
- Workshop co-organizer** (with J. Manchak and C. Smeenk), “Philosophy of Cosmology,” Rotman Institute of Philosophy, Western University, June 2017.
- Conference co-organizer** (with E. Curiel, K. Davey, T. Pashby, and K. Thebault), “The Philosophy of Howard Stein,” Franke Institute for the Humanities, University of Chicago, June 2017.
- Scientific organizing committee**, “First Hermann Minkowski Meeting on the Foundations of Spacetime Physics,” Institute for Foundational Studies Hermann Minkowski, Varna, Bulgaria, May 2017.

Workshop co-organizer (with J. Manchak and C. Smeenk), “Methodology and Epistemology in Cosmology,” University of California, Irvine, February 2017.

Workshop co-organizer (with J. Manchak and C. Smeenk), “Philosophy of Cosmology,” Waterloo, ON, July 2016.

Scientific Organizing Committee, “Fourth International Conference on the Nature and Ontology of Spacetime,” Institute for Foundational Studies Hermann Minkowski, Varna, Bulgaria, May 2016.

Workshop co-organizer (with J. Heis, P. Maddy, and P. K. Stanford), “The Scientific Berkeley,” University of California, Irvine, May 2016.

Workshop co-organizer (with N. Boyd, H. Halvorson, J. Norton, G. Valente), “The Field Concept in Physics,” University of Pittsburgh, April 2016.

Conference co-organizer (with N. Boyd, H. Halvorson, J. Norton, G. Valente), Fourth Annual Irvine-Pittsburgh-Princeton Conference on the Mathematical and Conceptual Foundations of Physics, University of Pittsburgh, March 2016.

Workshop co-organizer (with H. Halvorson, M. McSweeney, and G. Valente), “Equivalent Theories,” Princeton University, March 2015.

Conference co-organizer (with H. Halvorson, M. McSweeney, G. Valente), Third Annual Irvine-Pittsburgh-Princeton Conference on the Mathematical and Conceptual Foundations of Physics, Princeton University, March 2015.

Program committee, Philosophy of Science Association 2014 Biennial Meeting, November 2014.

Conference faculty sponsor, “Perspectives on Gender,” Hypatia Society, University of California, Irvine, October 2014.

Workshop co-organizer (with P. Maddy, S. Walsh, and J. Heis), “Mathematical Depth,” Department of Logic and Philosophy of Science, University of California, Irvine, April 2014.

Workshop co-organizer (with J. Barrett, H. Halvorson, and G. Valente), “Gauge Theory,” Department of Logic and Philosophy of Science, University of California, Irvine, March 2014.

Conference co-organizer (with J. Barrett, B. Feintzeig, H. Halvorson, and G. Valente), Second Annual Irvine-Pittsburgh-Princeton Conference on the Mathematical and Conceptual Foundations of Physics, University of California, Irvine, March 2013.

Program committee, 17th UK and European Meeting on the Foundations of Physics, Munich Center for Mathematical Philosophy, Ludwig-Maximilians University Munich, July 2013.

Workshop co-organizer (with M. Ernst, P. Maddy, and S. Walsh), “Category Theoretic Foundations of Mathematics,” Department of Logic and Philosophy of Science, University of California, Irvine, May 2013.

Conference co-organizer (with H. Halvorson, M. Miller, and G. Valente), First Annual Irvine-Pittsburgh-Princeton Conference on the Mathematical and Conceptual Foundations of Physics, University of Pittsburgh, April 2013.

Workshop co-organizer (with J. Earman and G. Valente), “Relativistic Causality between Quantum Field Theory and General Relativity,” Center for Philosophy of Science, University of Pittsburgh, April 2013.

Conference coordinator, Philosophy of Physics Workshop, University of California, Irvine, April 2011.

Other Professional Service

Advisory Board, Seven Pines Symposium Series, Stillwater, MN, 2017–Present.

Convener/Organizer, Southern California Philosophy of Physics Group, Irvine, CA, 2013–Present.

Science advisory board, Sage Hill High School, Newport Coast, CA, 2013–Present.

Review Panelist, National Endowment for the Humanities, Enduring Questions Program, Washington, DC, 2015.

Referee for: National Science Foundation, Swiss National Science Foundation, Oxford University Press, Routledge, Springer, Birkhäuser, *Philosophy of Science*, *British Journal for Philosophy of Science*, *Synthese*, *Erkenntnis*, *Philosophical Review*, *Australasian Journal of Philosophy*, *Journal of the American Philosophical Association*, *Ergo*, *Episteme*, *Studies in History and Philosophy of Modern Physics*, *Foundations of Physics*, *Philosophia Mathematica*, *Social Epistemology*, *International Studies in the Philosophy of Science*, *Applied Physics B*, *International Journal of Modern Physics D*, *Lato Sensu: revue de la société de philosophie des sciences*.

University and Departmental Service

At the University of California, Irvine

Director of Graduate Studies, Department of Logic and Philosophy of Science, 2013–Present.

DECADE Faculty Mentor for Logic and Philosophy of Science, Diverse Educational Community and Doctoral Experience (DECADE) Program, 2012–Present.

Website Liaison, Department of Logic and Philosophy of Science, 2012–Present.

Graduate Dean's Dissertation Fellowship Committee, Graduate Division, 2014; 2015; 2017 [Chair].

Eugene Cota-Robles Selection Committee, Graduate Division, 2016.

CHP Board Member, UCI Campuswide Honors Program, 2013–2016. (**Chair**, 2014–2016).

Placement Committee, Department of Logic and Philosophy of Science, 2013–2015.

Admissions Committee, Department of Logic and Philosophy of Science, 2012–2013.

Colloquium Director, Department of Logic and Philosophy of Science, 2012–2013.

Faculty Mentor Program and President's Dissertation Year Fellowship Committee, Graduate Division, 2013.

Graduate Student Representative, Department of Logic and Philosophy of Science, 2009–2010.

At the Stevens Institute of Technology

Faculty/staff advisor, *Red Shift* (undergraduate literary and art magazine), 2006–2007.

Graduate Student Committees

Marian Gilton (LPS), advancement committee (**chair**), Winter 2017; dissertation committee (**chair**), Spring 2018 [expected].

Sarita Rosenstock (LPS), advancement committee (**chair**), Spring 2016; dissertation committee (**chair**), Spring 2018 [expected].

John Dougherty (Philosophy, UC San Diego), advancement committee, Winter 2015; dissertation committee, Spring 2018 [expected].

bf Thomas Barrett (Philosophy, Princeton), dissertation reader / final public oral committee member, Summer 2017.

Kristen McKee (Physics), advancement committee, Spring 2017.

Benjamin Lillard (Physics), advancement committee, Spring 2017.

Daniel Antrim (Physics), advancement committee, Fall 2016.

Benjamin Feintzeig (LPS), advancement committee (**chair**), Winter 2015; dissertation committee (**chair**), Spring 2016. (Placement: TT at University of Washington.)

Anna Kwa (Physics), advancement committee, Summer 2015.

Nicolas Canac (Physics), advancement committee, Fall 2014.

Anthony DiFranzo (Physics), advancement committee, Summer 2014.

Michael Ernst (LPS), dissertation committee, Summer 2014.

Samuel Fletcher (LPS), advancement committee (**chair**), Winter 2013; dissertation committee (**chair**), Spring 2014. (Placement: TT at University of Minnesota.)

Mohammad Abdullah (Physics), advancement committee, Winter 2013.

Other Employment

Assistant Director, Center for Science Writings, Stevens Institute of Technology, 2005–2007.

Professional Societies

Philosophy of Science Association, European Philosophy of Science Association, American Philosophical Association, American Physical Society, Foundational Questions Institute, American Association for the Advancement of Science.