

Samuel C. Fletcher

Curriculum Vitae

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Areas of Specialization and Competence

- AOS Philosophy of Physics, Philosophy of Science, Philosophy of Statistics.
AOC Logic, Theory of Computation, Metaphilosophy, History of Philosophy of Science.

Academic Employment and Affiliations

Primary Appointments

- 2021– **Associate Professor**, *Department of Philosophy, University of Minnesota, Twin Cities*
2015–2021 **Assistant Professor**, *Department of Philosophy, University of Minnesota, Twin Cities*
2014–2017 **Marie Curie Fellow**, *Munich Center for Mathematical Philosophy, Ludwig-Maximilians-Universität München*
Summer 2013 **Teaching Associate**, *University of California, Irvine*
Spring 2010 **Researcher for Everett Papers Archive and Commentary**, *University of California, Irvine*, National Science Foundation Grant #0924135
For PI Prof. Jeffrey Barrett.

Secondary Appointments

- 2020–2022 **McKnight Land-Grant Professor**, *University of Minnesota, Twin Cities*
2017– **External Member**, *Munich Center for Mathematical Philosophy, Ludwig-Maximilians-Universität*
2016– **Resident Fellow**, *Minnesota Center for Philosophy of Science, University of Minnesota, Twin Cities*

Visiting Appointments

- Feb-Jul 2023 **Humboldt Research Fellow**, *Institute of Philosophy, University of Bonn*
Aug 2022-Jan 2023 **Academic Visitor**, *Centre for the Philosophy of Natural and Social Sciences, London School of Economics and Political Science*
Jul-Aug 2022 **Bristol Visiting Professor**, *University of Bristol*
Apr-Jun 2022 **Visiting Scholar**, *Corpus Christi College, Oxford*
Jan-Mar 2022 **Christensen Visiting Fellow**, *St Catherine's College, Oxford*
Jan-Jun 2022 **Academic Visitor**, *Faculty of Philosophy, Oxford University*
Summer 2021 **Visiting Associate Research Professor**, *Department of Logic and Philosophy of Science, University of California, Irvine*
Spring 2020 **Visiting Fellow**, *Center for Philosophy of Science, University of Pittsburgh*
May 2017 **Visiting Scholar**, *Department of Philosophy, University of Geneva*

Mar-Apr 2014 **Visiting Scholar**, *Department of Philosophy, University of Pittsburgh*

Education

- 2014 **PhD in Philosophy**, *University of California, Irvine*
Philosophy of physics emphasis.
Dissertation Title: "Similarity and Spacetime: Studies in Intertheoretic Reduction and Physical Significance."
Committee: James Weatherall (UCI, chair), Jeffrey A. Barrett (UCI), P. Kyle Stanford (UCI), Christian Wüthrich (UCSD).
- 2012 **MA in Philosophy**, *University of California, Irvine*
- 2012 **MS in Statistics**, *University of California, Irvine*
- 2008 **AB in Physics**, *Princeton University*
Certificate (minor) in Applied and Computational Mathematics.
Senior Thesis Title: "Characterization of the Quantum States Simulable with Two Popescu-Rohrlich Boxes."
Advisor: Hans Halvorson.

Publications

All items peer refereed except as indicated.

* *editor refereed*

** *not refereed*

Authored Books

Forthcoming in 2023 SCF. *Foundations of General Relativity*. Cambridge Elements in the Philosophy of Physics, Cambridge University Press.

Edited Collections

- 2021/2* SCF. *Metaphilosophy of Formal Methods*, topical collection in *Synthese*.
- 2019 * SCF, Jürgen Landes, and Roland Poellinger. *Evidence Amalgamation in the Sciences*, special issue in *Synthese* 196(8).
13 refereed contributions, <https://link.springer.com/journal/11229/196/8>.
- * SCF, Patricia Palacios, Laura Ruetsche, and Elay Shech. *Infinite Idealizations in Science*, special issue in *Synthese* 196(5).
14 refereed contributions, <https://link.springer.com/journal/11229/196/5>.
- 2018 Michael E. Cuffaro and SCF. *Physical Perspectives on Computation, Computational Perspectives on Physics*. Cambridge University Press.
12 commissioned chapters, <https://doi.org/10.1017/9781316759745>.
2020 paperback edition: <https://doi.org/10.1017/9781316622025>.
Reviewed in *Contemporary Physics* 60(1), 2019, 100–101, <https://doi.org/10.1080/00107514.2019.1608310>.

Journal Articles

- Forthcoming SCF. "The Stopping Rule Principle and Confirmational Reliability," *Journal for General Philosophy of Science*.
- 2022 SCF. "Replication Is for Meta-Analysis," *Philosophy of Science* 89(5): 960–969.
<https://doi.org/10.1017/psa.2022.38>.

- SCF and Nathan Lackey. "The Introduction of Topology into Analytic Philosophy: Two Movements and a Coda." *Synthese* 200(197).
<https://doi.org/10.1007/s11229-022-03689-9>.
- 2021 SCF, Joshua Knobe, Gregory Wheeler, and Brian Allan Woodcock. "Changing Use of Formal Methods in Philosophy: Late 2000s vs. Late 2010s." *Synthese* 199(5–6): 14555–14576.
<https://doi.org/10.1007/s11229-021-03433-9>.
- SCF and David E. Taylor. "Two Quantum Logics of Indeterminacy." *Synthese* 199(5–6): 13247–13281.
<https://doi.org/10.1007/s11229-021-03375-2>.
- SCF and David E. Taylor. "Quantum Indeterminacy and the Eigenstate-Eigenvalue Link." *Synthese* 199(3–4): 11181–11212.
<https://doi.org/10.1007/s11229-021-03285-3>.
- SCF. "Similarity Structure and Diachronic Emergence." *Synthese* 198(9): 8873–8900.
<https://doi.org/10.1007/s11229-020-02605-3>.
- SCF. "Counterfactual Reasoning within Physical Theories." *Synthese* 198(16): 3877–3898.
<https://doi.org/10.1007/s11229-019-02085-0>.
- SCF. "How (not) to measure replication." *European Journal for Philosophy of Science* 11(57): 1–27.
<https://doi.org/10.1007/s13194-021-00377-2>.
- SCF. "An Invitation to Approximate Symmetry, with Three Applications to Intertheoretic Relations." *Synthese* 198(5): 4811–4831.
<https://doi.org/10.1007/s11229-019-02371-x>.
- SCF. "The Role of Replication in Psychological Science." *European Journal for Philosophy of Science* 11(23): 1–19.
<https://doi.org/10.1007/s13194-020-00329-2>.
- 2020 SCF. "Which Worldlines Represent Possible Particle Histories?" *Foundations of Physics* 50(6): 582–599.
<https://doi.org/10.1007/s10701-019-00260-4>.
- SCF. "Similarity Structure and Emergent Properties." *Philosophy of Science* 87(2): 281–301.
<https://doi.org/10.1086/707563>.
- SCF. "On Representational Capacities, with an Application to General Relativity." *Foundations of Physics* 50(4): 228–249.
<https://doi.org/10.1007/s10701-018-0208-6>.
- SCF. "The Principle of Stability." *Philosophers' Imprint* 20(3): 1–22.
<http://hdl.handle.net/2027/spo.3521354.0020.003>.
- 2019 SCF. "On the Reduction of General Relativity to Newtonian Gravitation." *Studies in History and Philosophy of Modern Physics* 68: 1–15.
<https://doi.org/10.1016/j.shpsb.2019.04.005>.
- * SCF, Jürgen Landes, and Roland Poellinger. "Evidence Amalgamation in the Sciences: An Introduction." *Synthese* 196(8): 3163–3188.
<https://doi.org/10.1007/s11229-018-1840-6>.

- SCF. "Minimal Approximations and Norton's Dome." *Synthese* 196(5): 1749–1760.
<https://doi.org/10.1007/s11229-018-1676-0>.
- * SCF, Patricia Palacios, Laura Ruetsche, and Elay Shech. "Infinite Idealizations in Science: An Introduction." *Synthese* 196(5): 1657–1669.
<https://doi.org/10.1007/s11229-018-02069-6>.
- SCF. "Stopping Rules as Experimental Design." *European Journal for Philosophy of Science* 9(29): 1–20.
<https://doi.org/10.1007/s13194-019-0252-x>.
- 2018 SCF. "Global Spacetime Similarity." *Journal of Mathematical Physics* 59(11): 112501.
<https://doi.org/10.1063/1.5052354>.
- SCF. "Computers in Abstraction/Representation Theory." *Minds and Machines*: 28(3): 445–463.
<https://doi.org/10.1007/s11023-018-9470-9>.
- SCF, J. B. Manchak, Mike D. Schneider, and James Owen Weatherall. "Would Two Dimensions Be World Enough for Spacetime?" *Studies in History and Philosophy of Modern Physics* 63: 100–113.
<https://doi.org/10.1016/j.shpsb.2017.12.004>.
- 2017 Benjamin H. Feintzeig and SCF. "On Noncontextual, Non-Kolmogorovian Hidden Variable Theories." *Foundations of Physics* 47(2): 294–315.
<https://doi.org/10.1007/s10701-017-0061-z>.
- 2016 SCF. "Similarity, Topology, and Physical Significance in Relativity Theory." *The British Journal for the Philosophy of Science* 67(2): 365–389.
<https://doi.org/10.1093/bjps/axu044>.
- 2013 SCF. "Light Clocks and the Clock Hypothesis." *Foundations of Physics* 43(11): 1369–1383.
<https://doi.org/10.1007/s10701-013-9751-3>.
- 2012 SCF. "What Counts as a Newtonian System? The View from Norton's Dome." *European Journal for Philosophy of Science* 2(3): 275–297.
<https://doi.org/10.1007/s13194-011-0040-8>.
- Book Chapters**
- Forthcoming SCF. "Similarity Structure on Scientific Theories," in Bartłomiej Skowron, ed. *Topological Philosophy*. De Gruyter.
- * SCF and Conor Mayo-Wilson. "Evidence in Classical Statistics," in Maria Lasonen-Aarnio and Clayton Littlejohn, eds. *Routledge Handbook of the Philosophy of Evidence*.
- 2021 * SCF. "Relativistic Spacetime Structure," in Eleanor Knox and Alastair Wilson, eds. *Routledge Companion to the Philosophy of Physics*, pp. 160–179.
- * SCF. "Modality in Physics," in Otávio Bueno and Scott A. Shalkowski, eds. *Routledge Handbook of Modality*, pp. 251–264.
<https://doi.org/10.4324/9781315742144-29>
- 2020 SCF. "Approximate Local Poincaré Spacetime Symmetry in General Relativity," in Claus Beisbart, Tilman Sauer, and Christian Wüthrich, eds. *Thinking about Space and Time*. Einstein Studies, vol. 15. Birkhäuser, pp. 247–267.
https://doi.org/10.1007/978-3-030-47782-0_12.

- 2019 Neil Dewar, SCF, and Laurenz Hudetz. "Extending List's Levels," in Marek Kuś and Bartłomiej Skowron, eds. *Category Theory in Physics, Mathematics, and Philosophy*. Springer, pp. 63–81.
https://doi.org/10.1007/978-3-030-30896-4_6.
- 2018** Micheal E. Cuffaro and SCF. "Introduction," in Michael E. Cuffaro and Samuel C. Fletcher, eds. *Physical Perspectives on Computation, Computational Perspectives on Physics*. Cambridge University Press, pp. 1–19.
<https://doi.org/10.1017/9781316759745.001>.
- 2017 SCF. "Indeterminism, Gravitation, and Spacetime Theory," in Gábor Hofer-Szabó and Leszek Wroński, eds. *Making It Formally Explicit: Probability, Causality and Indeterminism*. Springer, pp. 179–191.
https://doi.org/10.1007/978-3-319-55486-0_10.

Reviews of Books and Articles

- 2022** SCF. "Review of *Einstein's war—how relativity triumphed amid the vicious nationalism of World War I* (Dutton, New York (2019), vi+390 pp, by Matthew Stanley)." *Mathematical Reviews/MathSciNet* 4248807.
<https://mathscinet.ams.org/mathscinet-getitem?mr=4248807>.
- ** SCF. "Review of 'A topological approach to infinity in physics and biophysics,' (in *Found. Sci.* 26 (2021), no. 2, 245–255, by Arturo Tozzi and James F. Peters)." *Mathematical Reviews/MathSciNet* 4263614.
<https://mathscinet.ams.org/mathscinet-getitem?mr=4263614>.
- ** SCF. "Review of 'Past, present and future modally introduced,' (in *Synthese* 198 (2021), no. 4, 3603–3624, by Tomasz Placek)." *Mathematical Reviews/MathSciNet* 4246354.
<https://mathscinet.ams.org/mathscinet-getitem?mr=4246354>.
- 2021** SCF. "Review of 'The constituents of an explication,' (in *Synthese* 197 (2020), no. 3, 983–1010, by Moritz Cordes)." *Mathematical Reviews/MathSciNet* 4077265.
<https://mathscinet.ams.org/mathscinet-getitem?mr=4077265>.
- ** SCF. "Review of 'What were the genuine Banach spaces in 1922? Reflection on axiomatisation and progression of the mathematical thought,' (in *Arch. Hist. Exact Sci.* 74 (2020), no. 2, 109–129, by Frédéric Jaëck)." *Mathematical Reviews/MathSciNet* 4060494.
<https://mathscinet.ams.org/mathscinet-getitem?mr=4060494>.
- ** SCF. "Review of 'Cécile Morette and the Les Houches summer school for theoretical physics; or, how Girl Scouts, the 1944 Caen bombing and a marriage proposal helped rebuild French physics (1951–1972),' (in *British J. Hist. Sci.* 52 (2019), no. 4, 595–616, by Pierre Verschuere)." *Mathematical Reviews/MathSciNet* 4069452.
<https://mathscinet.ams.org/mathscinet-getitem?mr=4069452>.
- 2020 * SCF. "Of War or Peace? Essay Review of *Statistical Inference as Severe Testing*." *Philosophy of Science* 87(4): 755–762.
<https://doi.org/10.1086/709787>.
- ** SCF. "Review of 'Logical expressivism, logical theory and the critique of inferences,' (in *Synthese* 196 (2019), no. 11, 4493–4509, by Georg Brun)." *Mathematical Reviews/MathSciNet* 4022248.
<https://mathscinet.ams.org/mathscinet-getitem?mr=4022248>.

- 2017 * SCF. "Against the Topologists: Essay Review of *New Foundations for Physical Geometry*." *Philosophy of Science* 84(3): 595–603.
<https://doi.org/10.1086/692150>.
 Conference Proceedings
- 2009** SCF. "Towards a Graph-Theoretic Characterization of Popescu-Rohrlich Box Simulation Strategies," in A. Lvovsky, ed. *Proceedings of Quantum Communication, Measurement and Computing: The Ninth International Conference*. AIP Conference Proceedings 1110, pp. 109–112.
- Other
- 2021** SCF, Joshua Knobe, Gregory Wheeler, and Brian Alan Woodcock. "Evidence for a Probabilistic Turn in Philosophy." *Daily Nous*.
<https://dailynous.com/2021/09/24/evidence-for-a-probabilistic-turn-in-philosophy-guest-post/>.
- * SCF. "The Argument Clinic." *Teaching and Learning Video Series, Blog of the APA*.
<https://blog.apaonline.org/2021/03/24/the-argument-clinic/>.
- 2018** SCF. "What's Hot in Mathematical Philosophy." *The Reasoner* 12(6): 50–51.
<https://blogs.kent.ac.uk/thereasoner/files/2018/06/TheReasoner-126.pdf>.
- 2017** SCF. Foreword to Andrew Lucia, *A Catalog of Difference*. UMinn Papers on Architecture 2. University of Minnesota School of Architecture, pp. 7–9.
- 2013** SCF. "U-Phil: 'Model Verification and the Likelihood Principle.'" *Error Statistics Philosophy*.
<https://errorstatistics.com/2013/01/27/u-phil-s-fletcher-n-jinn/>.

Principal Awards, Grants, and Honors

- 2023–2025 **Humboldt Research Fellowship for Experienced Researchers**, *Institute of Philosophy, University of Bonn*
 For "Motion, Coordinates, Energy, Waves: Themes for an Integrated History and Philosophy of the General Theory of Relativity".
- 2022–2023 **Mid-Career Faculty Research Award**, *College of Liberal Arts, University of Minnesota, Twin Cities*, \$39,710
 For "Mary Somerville, Philosopher," with Co-PI Jessica Gordon-Roth.
- 2022 **Lisa Jardine Grant Scheme**, *The Royal Society*, £2,000
 For "Mary Somerville on the Unity of Science."
- 2022 **Summer Stipend**, *National Endowment for the Humanities*, \$6,000
 For "Mary Somerville on the Unity of Science."
- 2021–2026 **CAREER Grant**, *National Science Foundation*, \$442,998
 For "A Modern Philosophy for Classical Statistical Testing and Estimation."
- 2021–2023 **Standard Grant**, *National Science Foundation*, \$450,950
 For "Quantum Epistemology Beyond Quantum Measurement," Co-PI with PI Benjamin H. Feintzeig (University of Washington).
- 2020–2022 **McKnight Land-Grant Professorship**, *University of Minnesota*, \$50,000
- 2020–2022 **Large Grant Program: Intelligence in the Physical World**, *Foundational Questions Institute & Fetzer Franklin Fund*, \$89,448
 For "Agential Abstraction/Representation Theory."

- Spring 2020 **Single Semester Leave**, *University of Minnesota, Twin Cities*
For research project, "A New Philosophy for Classical Statistics."
- 2019–2022 **Interdisciplinary Collaborative Workshop**, *College of Liberal Arts, University of Minnesota, Twin Cities*, \$58,910
For "The Many Faces of Reproducibility," with PI Alan C. Love and Co-I's Galin L. Jones, Matthew McGue, Alexander J. Rothman, and Niels G. Waller.
- 2019–2021 **Grant-in-Aid of Research, Artistry and Scholarship**, *Office of the Vice President for Research, University of Minnesota, Twin Cities*, \$28,849
For "Rethinking Formal Methods in Philosophy."
- 2019 **Imagine Fund Annual Faculty Award**, *University of Minnesota, Twin Cities*, \$5,000
For "Agency, Epistemic Community, and the Nature of Computation."
- 2018–2019 **Small Grant Fund**, *American Philosophical Association*, \$5,000
For "Rethinking Formal Methods Training in Philosophy."
- 2017 **Faculty Development Leave**, *University of Minnesota, Twin Cities*
For completion of Marie Curie Fellowship, Fall 2017.
- 2016 **Finalist: The Secret Life of Buildings Architectural Design Competition**, *Center for American Architecture and Design, School of Architecture, University of Texas, Austin*
With Andrew Lucia and Iroha Ito.
- 2016 **Fund for Diversity and Inclusiveness Grant**, *American Philosophical Association*, \$1,000
For "Third Summer School on Mathematical Philosophy for Female Students."
- 2014–2017 **Marie Curie International Incoming Fellowship**, *European Commission*
- 2014 **Order of Merit: Outstanding Graduate Student Scholarship**, *School of Social Sciences, University of California, Irvine*
- 2013–2014 **Doctoral Dissertation Improvement Grant**, *National Science Foundation*, \$11,669
- 2010–2014 **Graduate Research Fellowship**, *National Science Foundation*
- 2009 **Robert K. Clifton Memorial Book Prize**, *University of Western Ontario*
For "A Stop on the Hard Road to Determinism: Cases from Classical Physics."
- 2008–2014 **School of Social Sciences Merit Fellowship**, *University of California, Irvine*
- 2008 **Maria Goeppert-Mayer Studentship**, *American Physical Society*
For "The Manhattan Project and Its Effects on American Women Scientists."
- 2004–2008 **Pfizer Inc Merit Scholarship**, *National Merit Scholarship Corporation*

Presentations

Invited Presentations

- 6/2023 "TBA." *Metaphysics Beyond Spacetime 2023 (Ovronnaz, Switzerland)*.
- 5/2023 "TBA." *Institut für Philosophie, FAU Erlangen-Nürnberg*.
- 3/2023 "TBA." *Descartes Centre, Utrecht University*.
- 3/2023 "What Was the Replication Crisis?" *Philosophical Perspectives on Psychology's Replication 'Crisis' (University of Edinburgh)*.
- 1/2023 "What Was the Replication Crisis?" *Chair for Philosophy and History of Science, Ruhr-Universität Bochum*.

- 12/2022 "Dependence, Ontology, and Counterfactuals in General Relativity." FraMEPhys Workshop: Models and Modal in Physics (University of Birmingham).
- 12/2022 "Ontological Implications of Time Travel in General Relativity." Department of Philosophy, University of Geneva.
- 12/2022 "Science in Crisis? Reproducibility and the Philosophy of Science." Department of Philosophy, University of Bern.
- 12/2022 "The Representation and Determinable Structure of Quantum Properties." Department of Philosophy, University of Geneva.
- 12/2022 "The Representation and Determinable Structure of Quantum Properties." BBLOC Seminar (King's College, London).
- 11/2022 "Science in Crisis? Reproducibility and the Philosophy of Science." Popper Seminar (Department of Logic, Methodology, and Philosophy of Science, London School of Economics).
- 11/2022 "What Gravitational Waves Teach Us about Thermodynamics." New and Enduring Themes in the History and Philosophy of Quantum, Statistical, and Thermal Physics: Celebrating Jos Uffink's Research at Minnesota (University of Minnesota, Twin Cities).
- 11/2022 "What Was the Replication Crisis?" Mapping the Frontiers of Scientific Reproducibility: Foundational Questions (University of Minnesota, Twin Cities).
- 11/2022 "Physical Computation." Department of Electrical and Computer Engineering, University of Minnesota, Twin Cities.
- 10/2022 "Science in Crisis? Reproducibility and the Philosophy of Science." CamPoS Group (University of Cambridge).
- 7–8/2022 "Foundations of General Relativity I, II, III." Three lectures at the University of Bristol.
- 7/2022 "Reversible Computation Undermines and Vindicates Landauer's Principle." Landauer's Principle Workshop (University of Bristol).
- 7/2022 "Quantum Dynamic Consistency." Quantum and Non-Classical Probability and Epistemology (University of Bristol), with Jean Baccelli.
- 6/2022 "Evidence in Classical Statistics." Oxford Epistemology Group (Oxford University)
- 4/2022 "Limits of Nagelian Reduction." Mathematical Limits in Physics (Politecnico di Milano).
- 3/2022 "What Gravitational Waves Really Teach Us about Energy." Easter Spacetime Workshop, Oxford University.
- 3/2022 "What Gravitational Waves Really Teach Us about Energy." Warsaw Spacetime Colloquium, Warsaw University of Technology (by videoconferencing).
- 2/2022 "Relativistic Spacetime: Dependence and Ontology." Oxford Philosophy of Physics Research Seminar (Oxford University).
- 10/2021 "The Principle of Stability." Sigma Club, Centre for Philosophy of Natural and Social Sciences, London School of Economics (by videoconferencing).
- 5/2021 "The Essential Structure of a Surplus Structure Argument." Department of Logic and Philosophy of Science, University of California, Irvine (by videoconferencing).
- 5/2021 "Emergence, Explanation, and (Infinite) Idealization." Bristol Centre for Science and Philosophy (by videoconferencing).

- 4/2021 "Emergence, Explanation, and (Infinite) Idealization." Harvard Mini-Workshop on Infinities and Idealizations in Physics (by videoconferencing).
- 6/2020 "On Surplus Structure Arguments." History and Philosophy of Physics Research Seminar, Institute of Philosophy, University of Bonn (by videoconferencing).
- 6/2020 "Replication Is for Meta-Analysis." Interdisziplinäres Zentrum für Wissenschafts- und Techniforschung, Bergische University Wuppertal (by videoconferencing).
- 6/2020 "Causal Modeling as Counterfactual Semantics." Düsseldorf Center for Logic and Philosophy of Science, Heinrich Heine University Düsseldorf (by videoconferencing).
- 5/2020 "The Role of Replication: Psychological vs. Astrophysical Science." Bern CSH-Philosophy Workshop on Astrophysics and Replicability (by videoconferencing).
- 3/2020 "Severity and its potential application in particle physics data analysis." STAMPS Research Group, Department of Statistics and Data Science, Carnegie Mellon University (by videoconferencing).
- 2/2020 "Severe Testing." Lunchtime Talk, The Center for Philosophy of Science, University of Pittsburgh.
- 9/2019 "Reduction and Limits: Topological and Categorical." Categorical Approaches to Reduction and Limits, Munich Center for Mathematical Philosophy, LMU Munich (by videoconferencing).
- 6/2019 "The Topology of Intertheoretic Reduction." Work in Progress Seminar, Department of Philosophy, University of Salzburg.
- 9/2018 "The Reduction Heuristic." Work in Progress Series, Department of Philosophy, University of Minnesota, Twin Cities.
- 7/2018 "The Reduction Heuristic." Theory Construction in Physics: Historical and Philosophical Perspectives (Université de Montréal).
- 6/2018 "Counterfactual Reasoning within Physical Theories." Modality in Physics (Faculty of Philosophy, Jagiellonian University).
- 6/2018 "When 2 Become 1: Approaches to the Problem of Motion." A Mini-Workshop on the Problem of Motion and Geodesic Theorems in GR (California Institute of Technology).
- 6/2018 "The Principle of Stability." History and Philosophy of Science Seminar Series, California Institute of Technology.
- 3/2018 "The Topology of Intertheoretic Reduction." Multiple Realizability, Causation and Reductive Explanations in Science (Valparaiso, Chile).
- 3/2018 "The Reduction Heuristic." Department of Philosophy, Universidad Alberto Hurtado (Santiago de Chile).
- 12/2017 "The Principle of Stability." Research Colloquium in Philosophy (Chairs of Philosophy and History and Philosophy of the Mathematical Sciences, ETH Zürich).
- 11/2017 "The Topology of Intertheoretic Reduction." New Perspectives on Inter-theory Reduction (Department of Philosophy, University of Salzburg).
- 11/2017 "Severe Testing." Work in Progress Seminar, Department of Philosophy, University of Salzburg.
- 11/2017 "Emergence and Scale's Labyrinth." Oxford Philosophy of Physics Research Seminar (Oxford University).

- 10/2017 "The Principle of Stability." Department of Philosophy, University of Bristol.
- 10/2017 "The Principle of Stability." CamPoS Group (University of Cambridge).
- 7/2017 "Stopping rules as experimental design." Munich Center for Mathematical Philosophy, LMU Munich.
- 7/2017 "Approximate Spacetime Symmetries." Symmetries and Asymmetries in Physics (Leibniz University Hannover).
- 6/2017 "Approximate Spacetime Symmetries." With and Without Measure: Symmetry and Symmetry Breaking (MCMP, LMU Munich).
- 5/2017 "Reduction, Emergence, and Direct Limits." Space and Time after Quantum Gravity Speaker Series (Department of Philosophy, University of Geneva).
- 7/2016 "Elvis Has Left the Building." The Hole Shebang: New Perspectives on the Hole Argument (London School of Economics).
- 6/2016 "On the Alleged Incommensurability of Newtonian and Relativistic Mass." Munich Center for Mathematical Philosophy, LMU Munich.
- 6/2016 "The Principle of Stability." Department of Logic and Philosophy of Science, University of the Basque Country (San Sebastián/Donostia, Spain).
- 5/2016 "The Principle of Stability" & "The Logic of Severe Testing." Department of Philosophy, Boğaziçi University (Istanbul, Turkey).
- 5/2016 "Indeterminism, Gravitation, and Spacetime Theory." 5th Budapest-Krakow Workshop on Probability, Causality and Determinism (Institute of Philosophy, Hungarian Academy of Sciences, Budapest).
- 3/2016 "Experimental Design and the Likelihood Principle." Division of Health Policy and Management, School of Public Health, University of Minnesota, Twin Cities.
- 3/2016 "Experimental Design and the Likelihood Principle." School of Statistics, University of Minnesota, Twin Cities.
- 3/2016 "On the Alleged Incommensurability of Newtonian and Relativistic Mass." Departments of Philosophy and Physics, Macalaster College (St. Paul, MN).
- 2/2016 "Topological Structure on Scientific Theories." 5th International Ontological Workshop: Topological Philosophy (International Center for Formal Ontology, Warsaw).
- 2/2016 "On the Alleged Incommensurability of Newtonian and Relativistic Mass." Department of Epistemology, Institute of Philosophy, Jagiellonian University (Krakow, Poland).
- 1/2016 "Limits of Nagelian Reduction." Reduction in Physics and Biology (Institute of Philosophy and Complexity Sciences, Santiago, Chile).
- 11/2015 "Classical and Quantum Holism." Department of Philosophy, George Washington University.
- 11/2015 "Counterfactuals within Scientific Theories." Weekly Meeting, Department of Philosophy, University of Minnesota, Twin Cities.
- 5/2015 "Rethinking Relativistic Propagation." 3rd Budapest-Krakow Workshop on Probability, Causality and Determinism (Institute of Philosophy, Hungarian Academy of Sciences, Budapest).
- 4/2015 "Counterfactuals within Scientific Theories." Work in Progress Seminar, Munich Center for Mathematical Philosophy, LMU Munich.

- 4/2015 "On the Local Flatness of Spacetime." 42nd Annual Philosophy of Science Conference (Inter-University Centre Dubrovnik).
- 3/2015 "The Physical Basis of Computational Complexity." Department of Philosophy, University of Belgrade.
- 3/2015 "On the Reduction of General Relativity to Newtonian Gravitation." Astronomical Observatory of Belgrade.
- 3/2015 "Model Verification and the Likelihood Principle." Chance Encounters (University of Groningen).
- 3/2015 "On the Reduction of General Relativity to Newtonian Gravitation." Space-time Structuralism (Erasmus University Rotterdam).
- 3/2015 "The Physical Basis of Computational Complexity." Descartes Centre, Utrecht University.
- 3/2015 "Global Spacetime Similarity." Theoretical High Energy Physics Lunch Seminar Series, Radboud University Nijmegen.
- 2/2015 "The Topology of Intertheoretic Reduction." Institute for History and Philosophy of Science and Technology, Paris.
- 2/2015 "The Topology of Intertheoretic Reduction." Department of Philosophy, Communication and Media Studies, University of Rome 3.
- 1/2015 "On the Reduction of General Relativity to Newtonian Gravitation." Gravitation and Relativity Group, Institute for Theoretical Physics, University of Cologne.
- 12/2014 "Classical Field Theory and Intertheoretic Reduction: A Prolegomenon." Irvine-Munich Workshop on Foundations of Classical and Quantum Field Theories (MCMP, LMU Munich).
- 12/2014 "On Noncontextual, Non-Kolmogorovian Hidden Variable Theories." 2nd Budapest-Krakow Workshop on Probability, Causality and Determinism (Jagiellonian University, Krakow).
- 12/2014 "On the Local Flatness of Spacetime." Department of Philosophy, University of Salzburg.
- 11/2014 "On the Local Flatness of Spacetime." Philosophy of Physics Workshop (University of Bucharest).
- 11/2014 "The Topology of Intertheoretic Reduction." Department of Theoretical Philosophy, University of Bucharest.
- 10/2014 "On the Local Flatness of Spacetime." Vienna Center for Quantum Science and Technology.
- 10/2014 "On the Local Flatness of Spacetime." Munich Center for Mathematical Philosophy, LMU Munich.
- 10/2014 "On the Local Flatness of Spacetime." Sigma Club (London School of Economics).
- 9/2014 "On the Reduction of General Relativity to Newtonian Gravitation." Theoretical Philosophy Forum, Eötvös University (Budapest).
- 9/2014 "The Topology of Intertheoretic Reduction." Institute of Philosophy, Hungarian Academy of Sciences (Budapest).
- 4/2014 "The Principle of Stability." HPS Work in Progress Series (University of Pittsburgh).
- 1/2014 "The Topology of Intertheoretic Reduction." Department of Philosophy, University of Minnesota, Twin Cities.

- 1/2014 "The Topology of Intertheoretic Reduction." Department of Philosophy, Ohio University.
- 12/2013 "Causal Set Theory's *Hauptvermutung*." Center for the Humanities Research Group: The Fundamental Nature of Time and Change (University of California, San Diego).
- 11/2013 "On the Reduction of General Relativity to Newtonian Gravitation." Oxford Philosophy of Physics Research Seminar (Oxford University).
- 11/2013 "The Topology of Intertheoretic Reduction." CamPoS Group (University of Cambridge).
- 11/2013 "On the Reduction of General Relativity to Newtonian Gravitation." Sigma Club (London School of Economics).
- 10/2013 "The Topology of Intertheoretic Reduction." Philosophy of Science Reading Group (University of Washington).
- 4/2013 "Physicality and Topological Stability in Relativity Theory." Southern California Philosophy of Physics Group (University of California, Irvine).
- 9/2010 "What Counts as a Newtonian System? The View from Norton's Dome." Southern California Philosophy of Physics Group (University of California, Irvine).
- 6/2010 "Discussion Notes on Physical Computation." Southern California Philosophy of Physics Group (University of California, Irvine), with Jason Hoelscher-Obermaier.

Contributed Presentations

- 5/2023 "Supervaluationism, Determinacy, and the Completeness of Quantum Mechanics." From Science to Metaphysics? (UCLouvain), with David E. Taylor.
- 4/2023 "TBA." 49th Annual Philosophy of Science Conference (Inter-University Centre Dubrovnik).
- 3/2023 "A Functional Classification of Physical Principles, Illustrated by the Theory of Relativity." Principles in Physics (University of Wuppertal).
- 3/2023 "Supervaluationism, Determinacy, and the Completeness of Quantum Mechanics." DPG Spring Meeting of the Matter and Cosmos Section (TU Dresden), with David E. Taylor.
- 11/2022 "The Representation and Determinable Structure of Quantum Properties." 28th Biennial Meeting of the Philosophy of Science Association (Pittsburgh, PA), with David E. Taylor.
- 9/2022 "The Representation and Determinable Structure of Quantum Properties." 7th Annual Conference of the Society for the Metaphysics of Science (University of Bristol), with David E. Taylor.
- 8/2022 "The Introduction of Topology into Analytic Philosophy: Two Movements and a Coda." 5th TiLPS History of Analytic Philosophy Workshop (Tilburg University), with Nathan Lackey.
- 8/2022 "Causal Modeling as Counterfactual Semantics." Fourth International Conference of the German Society for Philosophy of Science, Technische Universität Berlin.
- 8/2022 "Replication Is for Meta-Analysis." Fourth International Conference of the German Society for Philosophy of Science, Technische Universität Berlin.
- 7/2022 "Quantum Dynamic Consistency." British Society for the Philosophy of Science Annual Meeting (University of Exeter), with Jean Baccelli.
- 4/2022 "The Introduction of Topology into Analytic Philosophy: Two Movements and a Coda." Formal Methods and Science in Philosophy IV (Inter-University Centre Dubrovnik), with Nathan Lackey (by videoconferencing).

- 3/2022 "What Gravitational Waves Really Teach Us about Energy." DPG Spring Meeting of the Matter and Cosmos Section (online).
- 11/2021 "Replication Is for Meta-Analysis." 27th Biennial Meeting of the Philosophy of Science Association (Baltimore, MD).
- 10/2021 "On Surplus Structure Arguments." 20th UK and European Meeting on the Foundations of Physics (La Sorbonne, Paris).
- 10/2021 "Replication Is for Meta-Analysis." PSX6: Uncertainty in Experimental Contexts (St. Louis University).
- 10/2021 "On Surplus Structure Arguments." VII Congreso Nacional de Filosofía, Asociación Chilena de Filosofía (online)
- 9/2021 "How (not) to measure replication." Metascience 2021 (online).
- 8/2021 "The Representation and Determinable Structure of Quantum Properties." DPG Meeting of the Matter and Cosmos Section (online), with David E. Taylor.
- 7/2021 "On Surplus Structure Arguments." Logic, Relativity, and Beyond: 4th International Conference (online).
- 7/2021 "Physical Computation and Landauer's Principle." British Society for the Philosophy of Science Annual Meeting (online).
- 6/2021 "Causal Modeling as Counterfactual Semantics." Eastern European Network for Philosophy of Science (University of Belgrade, by videoconferencing).
- 7/2020 "Replication Is for Meta-Analysis." Perspectives on Scientific Error 4 (Castelveccana, Italy, by videoconferencing).
- 7/2020 "Replication Is for Meta-Analysis." British Society for the Philosophy of Science Annual Meeting (University of Kent). [Conference canceled due to COVID-19 pandemic.]
- 2/2020 "Ontological Implications of Time Travel in General Relativity." Philosophy of Time Society, Central Division of the American Philosophical Association Annual Meeting (Chicago).
- 9/2019 "The Role of Replication in Psychological Science." European Philosophy of Science Association Biennial Conference (University of Geneva).
- 8/2019 "The Topology of Intertheoretic Reduction." 16th Congress of Logic, Methodology and Philosophy of Science and Technology (Czech Technical University in Prague).
- 7/2019 "The Topology of Intertheoretic Reduction." British Society for the Philosophy of Science Annual Meeting (Durham University).
- 7/2019 "Little Shallows in the Depths: Indeterminacy in Quantum Theory." Quantum Indeterminacy Workshop (Dartmouth College), with David E. Taylor.
- 6/2019 "Agential Abstraction/Representation Theory." MCMP-Western Ontario Workshop on Computation in Scientific Theory and Practice (LMU Munich).
- 5/2019 "Similarity Structure and Emergent Properties." Emergence: Conceptual and Philosophical Aspects (Dutch Institute for Emergent Phenomena, Amsterdam).
- 4/2019 "The Role of Replication in Psychological Science." Philosophy of Social Science Roundtable (University of Vermont).
- 3/2019 "Which Worldlines Represent Possible Particle Histories?" DPG Spring Meeting of the Matter and Cosmos Section (TU Munich).

- 11/2018 "Similarity Structure and Emergent Properties." 26th Biennial Meeting of the Philosophy of Science Association (Seattle, WA).
- 7/2018 "Reduction and Causal Set Theory's *Hauptvermutung*." 19th UK and European Meeting on the Foundations of Physics (Utrecht University).
- 7/2018 "Similarity Structure and Emergent Properties." 7^e Congrès de la Société de Philosophie des Sciences (University of Nantes).
- 6/2018 "Some Foundational Considerations for Making Replication Mainstream." UK XPhi Conference 2018 (University College London).
- 10/2017 "On the Alleged Incommensurability of Newtonian and Relativistic Mass." The Structure of Scientific Revolutions (Durham University).
- 9/2017 "Approximate Spacetime Symmetry." Thinking about Space and Time: 100 Years of Applying and Interpreting General Relativity (University of Bern).
- 9/2017 "Stopping Rules as Experimental Design." European Philosophy of Science Association Biennial Conference (University of Exeter).
- 8/2017 "Approximate Spacetime Symmetries." Logic, Relativity, and Beyond: 3rd International Conference (Rényi Institute, Budapest).
- 8/2017 "The Principle of Stability." Ninth European Congress of Analytic Philosophy (LMU Munich).
- 7/2017 "Stopping Rules as Experimental Design." British Society for the Philosophy of Science Annual Meeting (University of Edinburgh).
- 7/2017 "Approximate Spacetime Symmetries." Direct Empirical Status and the Ontology of Symmetries in Physics (Université Catholique de Louvain).
- 6/2017 "Stopping Rules as Experimental Design." Triennial International Conference of the Italian Society for Logic and Philosophy of Science (University of Bologna).
- 6/2017 "On Noncontextual, Non-Kolmogorovian Hidden Variable Theories." Quantum Contextuality in Quantum Mechanics and Beyond (Prague, Czechia).
- 10/2016 "On the Reduction of General Relativity to Newtonian Gravitation." 32nd Annual Boulder Conference on History and Philosophy of Science, "Gravity: Its History and Philosophy," (University of Colorado, Boulder).
- 8/2016 "On Noncontextual, Non-Kolmogorovian Hidden Variable Theories." 5th Summer School in the History and Philosophy of Science: Probability and Quantum Mechanics (University of Tübingen).
- 7/2016 "On the Alleged Incommensurability of Newtonian and Relativistic Mass." 18th UK and European Meeting on the Foundations of Physics (London School of Economics).
- 7/2016 "On the Alleged Incommensurability of Newtonian and Relativistic Mass." British Society for the Philosophy of Science Annual Meeting (University of Cardiff).
- 6/2016 "On the Alleged Incommensurability of Newtonian and Relativistic Mass." 6^e Congrès de la Société de Philosophie des Sciences (University of Lausanne).
- 6/2016 "The Principle of Stability." First Principles in Science: Their Epistemic Status and Justification (LMU Munich).
- 6/2016 "Emergence, Explanation, and (Infinite) Idealization." Infinite Idealizations in Science (LMU Munich).

- 6/2016 "On the Alleged Incommensurability of Newtonian and Relativistic Mass." Fourth International Conference on the Nature and Ontology of Spacetime (Varna, Bulgaria).
- 5/2016 "The Principle of Stability." Philosophy of Science in a Forest 2016—Dutch Association for Philosophy of Science (Doorn, the Netherlands).
- 2/2016 "Topological Structure on Scientific Theories." Philologica IV: Fourth Colombian Conference on Logic, Epistemology and Philosophy of Science (Bogotá, Colombia).
- 11/2015 "Counterfactuals within Scientific Theories." Iowa Philosophical Society (Iowa State University).
- 10/2015 "Emergence from the Labyrinth of Scale." Effective Theories, Mixed Scale Modeling, and Emergence (University of Pittsburgh).
- 8/2015 "Counterfactuals within Scientific Theories." 9th Principia International Symposium: Possible Worlds and their Applications in Philosophy and the Sciences (Florianópolis, Brazil).
- 8/2015 "Definitions and Contextualism for Topologies on the Space of Spacetimes." Logic, Relativity, and Beyond: 2nd International Conference (Rényi Institute, Budapest).
- 8/2015 "Counterfactuals within Scientific Theories." 15th Congress of Logic, Methodology and Philosophy of Science (University of Helsinki).
- 7/2015 "Limits of Nagelian Reduction." 4th Summer School in the History and Philosophy of Science: Idealizations in Physics (University of Tübingen).
- 7/2015 "Classical and Quantum Holism." 8th Conference of the Spanish Society for Logic, Methodology and Philosophy of Science (University of Barcelona).
- 7/2015 "Limits of Nagelian Reduction." British Society for the Philosophy of Science Annual Meeting (University of Manchester).
- 6/2015 "Counterfactuals within Scientific Theories." 5th World Congress and School on Universal Logic (University of Istanbul).
- 4/2015 "Counterfactuals within Scientific Theories." 3rd Meeting of the Nordic Network for Philosophy of Science (TINT, University of Helsinki).
- 3/2015 "Rethinking Relativistic Propagation." Rethinking Foundations of Physics (Dorfgastein, Austria).
- 3/2015 "Counterfactuals within Scientific Theories." Formal Methods and Science in Philosophy (Inter-University Centre Dubrovnik).
- 3/2015 "Classical Field Theory and Intertheoretic Reduction." 79th Annual Meeting of the Deutsche Physikalische Gesellschaft (TU Berlin).
- 1/2015 "The Physical Basis of Computation and Computational Complexity." Quantum Computation, Quantum Information, and the Exact Sciences (LMU Munich).
- 10/2014 "Classical and Quantum Holism." The Metaphysics of Quantum Mechanics (Corpus Christi College, Oxford University, poster presentation).
- 9/2014 "Global Spacetime Similarity." DPG Physics School on General Relativity @ 99 (Bad Honnef, Germany, poster presentation).
- 8/2014 "On the Local Flatness of Spacetime." 3rd International Interdisciplinary Summer School: Arches and Scaffoldings (University of Tübingen).

- 7/2014 "Interpreting Upper Probability Hidden Variable Models." 2nd International Summer School in Philosophy of Physics: Probabilities in Physics (Saig, Germany).
- 7/2014 "Global Spacetime Similarity." British Society for the Philosophy of Science Annual Meeting (Fitzwilliam College, University of Cambridge).
- 6/2014 "Global Spacetime Similarity." Society for Exact Philosophy Annual Meeting (CalTech, poster presentation).
- 3/2014 "A Note on the Reduction of General Relativity to Newtonian Gravitation." 2nd Irvine-Pittsburgh-Princeton Conference on the Mathematical and Conceptual Foundations of Physics (University of California, Irvine).
- 11/2013 "The Topology of Intertheoretic Reduction." Reduction and Emergence in the Sciences (LMU Munich).
- 11/2013 "Inference, Stability, and Meaning in Scientific Models." 4th Madrid Workshop on New Trends in the Philosophy of Science: Inferentialism in Epistemology and Philosophy of Science (UNED Madrid).
- 9/2013 "Reduction and Causal Set Theory's *Hauptvermutung*." Seminar on the Philosophical Foundations of Quantum Gravity (University of Illinois, Chicago).
- 6/2013 "On the Reduction of General Relativity to Newtonian Gravitation." Reduction and Emergence in Physics (LMU Munich).
- 4/2013 "Physicality and Topological Stability in Relativity Theory." Irvine-Pittsburgh-Princeton Conference on the Mathematical and Conceptual Foundations of Physics (University of Pittsburgh).
- 11/2012 "Design and Verify." Virginia Tech Graduate Philosophy of Science Conference (Blacksburg, VA).
- 9/2011 "A Matter of Kantian Gravity." Kant and the Exact Sciences Graduate Conference (University of Notre Dame).
- 7/2011 "Physical Computability, Efficiency, and the Church-Turing Thesis." 14th Congress of Logic, Methodology, and Philosophy of Science (University of Nancy, France), with Jason Hoelscher-Obermaier.
- 3/2010 "Spin Glasses: Explanation and Non-Rigorous Methods." University of Pittsburgh/Carnegie Mellon University Joint Graduate Philosophy Conference.
- 4/2009 "A Stop on the Hard Road to Determinism: Cases from Classical Mechanics." 6th Western Ontario Logic, Mathematics & Physics Graduate Philosophy Conference (University of Western Ontario).
- 8/2008 "Towards a Graph-Theoretic Characterization of Popescu-Rohrlich Box Simulation Strategies." 9th International Conference on Quantum Communication, Measurement and Computing (University of Calgary, poster presentation).
- 4/2008 "The Manhattan Project and its Effects on American Women Scientists." American Physical Society, Annual April Meeting (St. Louis, MO).
- 10/2007 "Jet Measurements for QGP Experiments at CMS." American Physical Society, Division of Nuclear Physics Annual Meeting (Newport News, VA, poster presentation).
- 8/2007 "Jet Measurements for QGP Experiments at CMS." Student Symposium, Los Alamos National Laboratory.

Seminar Guest Lectures

- 12/2017 Philosophy of Statistics (Dr. Rush Stewart), Munich Center for Mathematical Philosophy, LMU Munich.
- 12/2017 Reduction and Emergence (Patricia Palacios), Munich Center for Mathematical Philosophy, LMU Munich.
- 7/2017 Reduction and Emergence (Dr. Neil Dewar), Munich Center for Mathematical Philosophy, LMU Munich.
- 2/2016 Research Methods (Dr. George Biltz), School of Kinesiology, University of Minnesota, Twin Cities.
- 7/2014 Explanation and Reduction (Prof. Andreas Hüttemann), Department of Philosophy, University of Cologne.

Public and Outreach Presentations

- 7/2022 "Science in Crisis? Reproducibility and the Philosophy of Science" (University of Bristol).
- 8/2019 Facts and Fakes: Philosophers on the Search for Truth (University of Minnesota, Twin Cities), discussion facilitator.
- 4/2019 Anselm House University Roundtable: Are the sciences intellectually self-sufficient? (University of Minnesota, Twin Cities).
- 2/2019 "Reimagining Black Holes." A Brighter U: CLA in Space (University of Minnesota, Twin Cities).
- 1/2018 Honors Mentor Connection (Wayzata High School, Plymouth, MN).
- 4/2017 "Science: Why?" Let's Nerd Out! 5 (Minneapolis, MN).
- 4/2016 Research Overview Speaker for History and Philosophy of Physics, School of Physics and Astronomy, University of Minnesota, Twin Cities
- 3/2015 "How to Be Rational Without Really Trying." Who's In Town Lecture Series (Amsterdam University College).

Teaching Experience

University of Minnesota, Twin Cities

- Fall 2021 **Replication and Reproducibility in Science**
Graduate seminar. Course website: <https://canvas.umn.edu/courses/265727>.
- Fall 2021, **Mathematical Methods for Philosophy**
- Fall 2019 Introduction to sets, relations, statistics, and probability and decision theory, explicitly and through example applications. Course website: <https://canvas.umn.edu/courses/265713>.
- Spring 2021, **Introduction to Logic**
- Fall 2020, Lower division sentential and predicate logic with natural deduction. Latest course website: <https://canvas.umn.edu/courses/214940>.
- Spring 2018, <https://canvas.umn.edu/courses/214940>.
- Spring 2017,
- Spring 2016
- Fall 2020, **Space and Time**
- Fall 2018, Cross-listed undergraduate/graduate seminar. Latest course website: <https://canvas.umn.edu/courses/191129>.
- Fall 2016
- Fall 2020, **Directed Study: Space and Time**
- Fall 2018, Technical supplement to concurrent undergraduate/graduate seminar. 1 student in Fall '20, 3 students in Fall '18, 2 students in Fall '16.
- Fall 2016

- Fall 2020 **Directed Research: Which formal methods are most used in philosophy?**
Directed 5 undergraduates on a classification project of journal article, answering whether they used formal methods.
- Fall 2019, **Scientific Thought**
Spring 2018, Writing-intensive mid-level philosophy of science survey. Latest course website: <https://canvas.umn.edu/courses/132089>.
Fall 2016,
Spring 2016
- Spring 2019, **Symbolic Logic II**
Spring 2017 Graduate-level computability and incompleteness. Latest course website: <https://canvas.umn.edu/courses/95344>.
- Spring 2019 **Physical Perspectives on Computation, Computational Perspectives on Physics**
Graduate seminar. Course website: <https://canvas.umn.edu/courses/95441>.
- Spring 2019 **Directed Study: Equivalent Definitions of Computation**
Turing machines, abacus machines, and recursive functions (1 undergraduate, most of the first eight chapters of Boolos, Burgess, and Jeffrey's *Computation and Logic* (5th ed., Cambridge UP, 2007)).
- Spring 2017 **Directed Study: Conceptual and Mathematical Foundations of Classical Space-Time Theory**
Differential geometry and physics of special and general relativity (1 undergraduate student, at the level of Woodhouse's *General Relativity* (Springer, 2007)).
- Spring 2016 **Revolutions in Science: Lavoisier, Darwin, and Einstein**
Lower division, 1/3 of lectures (5 weeks), with Victor Boantz and Mark Borrello. Course website: <https://ay15.moodle.umn.edu/course/view.php?id=12003>.
- Fall 2015 **Philosophy of Statistics**
Graduate seminar. Course website: <https://ay15.moodle.umn.edu/course/view.php?id=7242>.
University of California, Irvine
- Summer 2013 **Critical Reasoning**
Lecturing and grading, lower division informal and formal sentential logic. Course website: <https://eee.uci.edu/13y/66010>.
- Spring 2013 **Introduction to Inductive Logic, Teaching Assistant**
Lower division.
- Winter 2010 **Introduction to Symbolic Logic, Teaching Assistant**
Lower division predicate logic.
- Fall 2009, **Critical Reasoning, Teaching Assistant**
Winter 2009, Lower division informal and formal sentential logic.
Fall 2008
- Center For Talented Youth (Johns Hopkins University)
- Summer 2009 **Mathematical Logic, Teaching Assistant, Loyola Marymount University, Los Angeles, CA**
Equivalent to lower division predicate logic.
- Summer 2008 **Nuclear Science, Teaching Assistant, Roger Williams University, Bristol, RI, 2 sessions of same course**
Equivalent to lower division course for non-majors.

Editorial Work

- 10/2020– **Associate Editor**, *Foundations of Physics*
3/2020– **Associate Editor**, *European Journal for Philosophy of Science*

Advisory Work

- 2020–2021 **Lectures and Awards Committee**, *Philosophy of Science Association*

School and Conference Organization

- 2023 **7th International Conference on the History and Philosophy of Computing (HaPoC-7)**, *Program Committee*, Warsaw University of Technology
- 2023 **21st UK and European Meeting on the Foundations of Physics**, *Program Committee Co-Chair*, University of Bristol
Selected and assigned submissions to program committee members.
- 2022 **New and Enduring Themes in the History and Philosophy of Quantum, Statistical, and Thermal Physics: Celebrating Jos Uffink's Research at Minnesota**, *Principal Organizer*, University of Minnesota, Twin Cities
Two-day hybrid workshop with 9 invited speakers.
- 2022 **Quantum Epistemology Beyond Quantum Measurement: Early Career Summer Seminar**, *Principal Co-Organizer*, Pack Forest, University of Washington
Three-day retreat with 8 graduate students and 3 invited senior scholars. Co-organized with Ben Feintzeig and Jer Steeger.
- 2022 **British Society for the Philosophy of Science Annual Meeting**, *Program Committee*, University of Exeter
Reviewed 11 extended abstracts.
- 2021 **British Society for the Philosophy of Science Annual Meeting**, *Program Committee*, online conference
Reviewed 9 extended abstracts.
- 2021 **American Physical Society April Meeting**, *Symposium Organizer*, online
Invited four speakers for Forum on the History of Physics symposium on physics and computation (with Mike Cuffaro).
- 2020 **Bayesian Epistemology: Perspectives and Challenges**, *Program Committee*, Munich Center for Mathematical Philosophy, LMU Munich
Reviewed 1 extended abstract. [Event online only due to COVID-19 pandemic.]
- 2020 **British Society for the Philosophy of Science Annual Meeting**, *Program Committee*, University of Kent
Reviewed 9 extended abstracts. [Event canceled due to COVID-19 pandemic.]
- 2020 **20th UK and European Meeting on the Foundations of Physics**, *Program Committee*, Paris
Reviewed 11 extended abstracts. [Event postponed to 2021 due to COVID-19 pandemic.]
- 2019 **American Philosophical Association Central Division Annual Meeting, 2020**, *Program Committee*, Chicago
Organized two invited symposia, reviewed 30 submitted papers, and invited commentators and chairs for three sessions.

- 2019 **Rethinking Formal Methods in Philosophy**, *Principal Organizer*, University of Minnesota, Twin Cities
Two-day workshop with 10 invited speakers and a public lecture by Cailin O'Connor on her 2018 book (with Jim Weatherall), *The Misinformation Age*.
- 2019 **ILMPS (Irvine-London-Munich-PoliMi-Salzburg) 2019 Conference**, *Program Committee*, University of Salzburg
Reviewed one submitted paper.
- 2019 **European Philosophy of Science Association Biennial Conference (EPSA19)**, *Program Committee*, University of Geneva
Reviewed 19 extended abstracts.
- 2019 **British Society for the Philosophy of Science Annual Meeting**, *Program Committee*, Durham University
Reviewed 7 extended abstracts.
- 2018 **IMPS (Irvine-Munich-PoliMi-Salzburg) 2018 Conference**, *Program Committee*, University of Salzburg
Reviewed one submitted paper.
- 2018 **British Society for the Philosophy of Science Annual Meeting**, *Program Committee*, Oxford University
Reviewed 15 extended abstracts.
- 2018 **Ninth International Workshop on Physics and Computation**, *Program Committee*, Fontainebleau, France
Reviewed 3 submitted papers.
- 2017 **Fourth Summer School on Mathematical Philosophy for Female Students**, *Organizing Committee*, Munich Center for Mathematical Philosophy, LMU Munich
Week-long school, duties shared with Marianna Antonutti, Lavinia Picollo, and Gil Sagi.
- 2017 **British Society for the Philosophy of Science Annual Meeting**, *Program Committee*, University of Edinburgh
Reviewed 15 extended abstracts.
- 2016 **Third Summer School on Mathematical Philosophy for Female Students**, *Organizing Committee*, Munich Center for Mathematical Philosophy, LMU Munich
Week-long school, duties shared with Milena Ivanova and Karolina Krzyżanowska.
- 2016 **Infinite Idealizations in Science**, *Organizing Committee*, Munich Center for Mathematical Philosophy, LMU Munich
Two-day workshop, duties shared with Patricia Palacios.
- 2016 **MuST 9: Evidence, Inference, and Risk**, *Program Committee*, Munich Center for Mathematical Philosophy, LMU Munich
Reviewed two extended abstracts.
- 2015 **1st Munich Graduate Workshop in Mathematical Philosophy: Philosophy of Physics**, *Organizing Committee & Lecturer*, Munich Center for Mathematical Philosophy, LMU Munich
Three-day workshop and school, organizing duties shared with Brian Padden, Patricia Palacios, and Karim Thébault. Delivered one seminar lecture.
- 2015 **Quantum Computation, Quantum Information, and the Exact Sciences**, *Organizing Committee*, Munich Center for Mathematical Philosophy, LMU Munich
Two-day conference, duties shared with Michael Cuffaro and Johannes Kofler.

- 2014 **Irvine-Munich Workshop on Foundations of Classical and Quantum Field Theories**, *Organizing Committee*, Munich Center for Mathematical Philosophy, LMU Munich
One-day workshop, duties shared with Karim Thébault.
- 2014 **2nd Irvine-Pittsburgh-Princeton Conference on the Mathematical and Conceptual Foundations of Physics**, *Program Committee*, University of California, Irvine
Reviewed one submitted paper.
- 2013 **1st Irvine-Pittsburgh-Princeton Conference on the Mathematical and Conceptual Foundations of Physics**, *Program Committee*, University of Pittsburgh
Reviewed one submitted paper.
- Conference Session Chairing
- 11/2022 **28th Biennial Meeting of the Philosophy of Science Association**, Pittsburgh, PA
- 11/2022 **New and Enduring Themes in the History and Philosophy of Quantum, Statistical, and Thermal Physics: Celebrating Jos Uffink's Research at Minnesota**, University of Minnesota, Twin Cities
- 8/2022 **Fourth International Conference of the German Society for Philosophy of Science**, Technische Universität Berlin
- 7/2022 **British Society for the Philosophy of Science Annual Meeting**, University of Exeter
- 7/2022 **Simonfest**, University of Oxford
- 11/2021 **27th Biennial Meeting of the Philosophy of Science Association**, Baltimore, MD
- 10/2021 **20th UK and European Meeting on the Foundations of Physics**, Paris
- 10/2021 **PSX6: Uncertainty in Experimental Contexts**, St. Louis University
- 7/2021 **British Society for the Philosophy of Science Annual Meeting**, online
- 4/2021 **American Physical Society April Meeting**, online
- 2/2020 **Central Division of the American Philosophical Association Annual Meeting**, Chicago
- 9/2019 **Rethinking Formal Methods in Philosophy**, University of Minnesota, Twin Cities
- 8/2019 **16th Congress of Logic, Methodology and Philosophy of Science and Technology**, Czech Technical University in Prague
- 5/2019 **Emergence: Conceptual and Philosophical Aspects**, Dutch Institute for Emergent Phenomena, Amsterdam
- 9/2017 **European Philosophy of Science Association Biennial Conference**, University of Exeter
- 8/2017 **Logic, Relativity, and Beyond: 3rd International Conference**, Rényi Institute, Budapest
- 8/2017 **Ninth European Congress of Analytic Philosophy**, LMU Munich
- 7/2017 **British Society for the Philosophy of Science**, University of Edinburgh
- 7/2016 **Foundations of Physics**, London School of Economics
- 6/2016 **The Semantics of Theories**, LMU Munich
- 6/2016 **First Principles in Science: Their Epistemic Status and Justification**, LMU Munich
- 6/2016 **Infinite Idealizations in Science**, LMU Munich

- 5/2016 **Philosophy of Science in a Forest 2016—Dutch Association for Philosophy of Science**, Doorn, the Netherlands
- 2/2016 **Topological Philosophy**, Warsaw, Poland
- 8/2015 **Logic, Relativity, and Beyond: 2nd International Conference**, Rényi Institute, Budapest
- 8/2015 **15th Congress of Logic, Methodology and Philosophy of Science**, University of Helsinki
- 4/2015 **1st Munich Graduate Workshop in Mathematical Philosophy: Philosophy of Physics**, LMU Munich
- 1/2015 **Quantum Computation, Quantum Information, and the Exact Sciences**, LMU Munich
- 11/2014 **24th Biennial Meeting of the Philosophy of Science Association**, Chicago, IL
- 4/2014 **88th Annual Meeting of the American Philosophical Association, Pacific Division**, San Diego, CA
- 11/2012 **23rd Biennial Meeting of the Philosophy of Science Association**, San Diego, CA
Workshop Commentaries
- 4/2022 **MCPS International Postdoc Forum**, “*Making Peace in the Statistics Wars: Simulation Studies in the Philosophy of Statistics*,” by WJ Peden, Minnesota Center for Philosophy of Science
- 3/2021 **MCPS International Postdoc Forum**, “*A Category Theoretic Framework for Physical Representation*,” by Sarita Rosenstock, Minnesota Center for Philosophy of Science
- 3/2017 **Author Meets Readers**, “*Representing Space in the Scientific Revolution*,” by David Marshall Miller, Minnesota Center for Philosophy of Science
- 7/2015 **The Problem of Time in Perspective**, “*Changing Observables in Canonical General Relativity from Hamiltonian-Lagrangian Equivalence*,” by J. Brian Pitts, Munich Center for Mathematical Philosophy
- 4/2015 **Nordic Network for Philosophy of Science**, “*On the limits of classical computational systems*,” by Michael Cuffaro, University of Helsinki
- Refereeing
- | | | | |
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| 2022 | <i>Acta Analytica</i> | 2017, '19, '21–22 | <i>American Journal of Physics</i> |
| 2018, '20 | <i>Analysis</i> | 2022 | <i>Behavior Research Methods</i> |
| 2014–15 | Birkhäuser Press | 2013–23 | <i>British Journal for the Philosophy of Science</i> |
| 2020 | Cambridge University Press | 2014 | <i>Canadian Journal of Physics</i> |
| 2020 | <i>Data</i> | 2016 | De Gruyter Press |
| 2019 | <i>dialectica</i> | 2014 | <i>Ergo</i> |
| 2014–15, '19, '21–22 | <i>Erkenntnis</i> | 2014–17, '20–22 | <i>European Journal for Philosophy of Science</i> |
| 2014–21 | <i>Foundations of Physics</i> | 2019, '22 | <i>Foundations of Science</i> |
| 2021 | <i>Histories</i> | 2020–21 | <i>International Studies in the Philosophy of Science</i> |

2016–17, '21–23	<i>Journal for General Philosophy of Science</i>	2019	<i>Journal of Geometry and Physics</i>
2020	<i>KRITERION: Journal of Philosophy</i>	2017	<i>Logique et Analyse</i>
2016	<i>Mind and Matter</i>	2014, '18–19, '22	<i>Minds & Machines</i>
2019, '22	<i>Philosophia</i>	2019	<i>Philosophical Inquiries</i>
2019	<i>Philosophical Papers</i>	2022	<i>Philosophical Psychology</i>
2019	<i>Philosophical Quarterly</i>	2021–22	<i>Philosophical Studies</i>
2020–22	<i>Philosophies</i>	2017	<i>Philosophy Compass</i>
2015	Polish National Science Centre	2016–19	National Science Foundation
2016, '23	Oxford University Press	2022	<i>Philosophy of Medicine</i>
2010–22	<i>Philosophy of Science</i>	2010–12	<i>Physics Letters A</i>
2010	<i>Praxis: Journal of Philosophy</i>	2016–17, '22	<i>Review of Symbolic Logic</i>
2020	<i>Roczniki Filozoficzne</i>	2021	Routledge
2015, '18	Springer-Verlag	2014–20	<i>Studies in History and Philosophy of Modern Physics</i>
2018–23	<i>Studies in History and Philosophy of Science</i>	2022	Swiss National Science Foundation
2015–23	<i>Synthese</i>	2017	<i>THEORIA: An Int'l Journal for Theory, History and Foundations of Science</i>
2016–18	<i>Universe</i>	2022	World Scientific

University, Institutional, and Departmental Service

University and Institutional Service

- 2022 **MCPS Unit Evaluation**, *College of Liberal Arts, University of Minnesota, Twin Cities*
Wrote administrative service evaluation for Minnesota Center for Philosophy of Science director Alan Love.
- 8/2021 **New Faculty Orientation Panel Speaker**, *Office of the Executive Vice President and Provost, University of Minnesota, Twin Cities*
One of three faculty selected for 60-minute panel on transitioning to a new faculty job at the University of Minnesota.
- 2021 **External Habilitation Assessment**, *Faculty of Philosophy, LMU Munich*
Roughly equivalent to a tenure evaluation letter.
- 2021 **Data Science Working Group**, *College of Liberal Arts, University of Minnesota, Twin Cities*
Included organizing and chairing roundtable on “Data Science and Human Values.”
- 2020– **Governing Board**, *Minnesota Center for Philosophy of Science, University of Minnesota, Twin Cities*
- 2020– **Executive Committee**, *Minnesota Center for Philosophy of Science, University of Minnesota, Twin Cities*
- Fall '20–, **Convener of Physics Interest Group**, *Minnesota Center for Philosophy of Science,*
Fall '18–'19 *University of Minnesota, Twin Cities*

- 2013–2014 **Dean's Fellowship Advisory Committee**, *School of Social Sciences, University of California, Irvine*
Elected to review extramural fellowship applications.
Departmental Service
- Spring 2022 **Salary Committee**, *Department of Philosophy, University of Minnesota, Twin Cities*
- Fall 2021 **Promotion & Tenure Committee**, *Department of Philosophy, University of Minnesota, Twin Cities*
- 2021–2022, **Placement Committee**, *Department of Philosophy, University of Minnesota, Twin Cities*
Fall '19
- 2018 **Diversity Committee and Colloquium Coordinator**, *Department of Philosophy, University of Minnesota, Twin Cities*
- 2018–2019, **Admissions and Aid Committee**, *Department of Philosophy, University of Minnesota, Twin Cities*
2016–2017
- '20–21 (chair) **Awards Committee**, *Department of Philosophy, University of Minnesota, Twin Cities*
2015–2016
- 2015 **Search Committee**, *Munich Center for Mathematical Philosophy, LMU Munich*
For Assistant Professor in philosophy of physics.
- 10/14–1/15 **Reading Group Organizer**, *Philosophy of Physics, Munich Center for Mathematical Philosophy, LMU Munich*
Winter term, focus on foundations of classical mechanics.
- 9/11–12/11 **Graduate Seminar Organizer**, *Philosophy of Probability, University of California, Irvine*
Sponsored by Brian Skyrms, attended by eight other graduate students and three faculty.
Student Supervision and Evaluation Committees
- Summer '22– **Dissertation Co-Advisor**, *Department of Philosophy, University of Minnesota, Twin Cities*, for Tomoya Imaizumi
- Winter '21– **Dissertation Committee**, *Department of Logic and Philosophy of Science, University of California, Irvine*, for David Mwakima
- Fall '21– **Dissertation Committee**, *Department of Philosophy, University of Minnesota, Twin Cities*, for Yoshinari Yoshida
- Fall '21 **Advancement Committee**, *Department of Logic and Philosophy of Science, University of California, Irvine*, for David Mwakima
- Spring '20 **Advancement Committee**, *Department of Philosophy, University of Minnesota, Twin Cities*, for Femke Kuiling
- Fall '19 **Advancement Committee**, *Department of Philosophy, University of Minnesota, Twin Cities*, for Yoshinari Yoshida
- Spring '19– **Dissertation Co-Advisor**, *Department of Philosophy, University of Minnesota, Twin Cities*, for Femke Kuiling
Summer '22
- Spring '20, **Three-paper (Qualifying) Exam Committee**, *Department of Philosophy, University of Minnesota, Twin Cities*
Fall '19, '18
- 5/2020 **M.Arch. Final Project Jury**, *School of Architecture, University of Minnesota, Twin Cities*
One of 4–5 faculty evaluating graduate student project proposals.

- 12/2018 **M.Arch. Studio Final Review Jury**, *School of Architecture, University of Minnesota, Twin Cities*
One of 4–5 faculty evaluating graduate student project proposals.
- Spring '19, **Senior Thesis Advisor**, *Department of Philosophy, University of Minnesota, Twin Cities*
Fall '18 (x2), Advised student on capstone research paper.
Summer '18
- Mar., May 2016 **B.D.A. Mid-term and Final Workshop Jury**, *School of Architecture, University of Minnesota, Twin Cities*
One of four faculty evaluating senior undergraduate student project proposals.
- 4/16–5/16 **Senior Honors Thesis Committee**, *School of Physics and Astronomy, University of Minnesota, Twin Cities*
Provided comments on thesis presentation, read and judged written thesis for *summa cum laude* recommendation.
- Fall '16, **Senior Project Advisor**, *Biology, Society, and Environment Program, University of Minnesota, Twin Cities*
Spring '16 Advised student on capstone research paper.
- Spring '16 **Academic Advisor**, *College of Liberal Arts Dean's Freshman Research and Creative Scholars Program, University of Minnesota, Twin Cities*
Advised two students on project "Varieties of Bayesianism".
- 11/2015 **First-year M.Arch. Midterm Studio Jury**, *School of Architecture, University of Minnesota, Twin Cities*
One of four faculty evaluating graduate student project proposals.
- Other Service and Training
- 10/2022 **Addressing Implicit Bias in Search and Selection Processes**, *University of Minnesota, Twin Cities*
Training on promising practices and resources for addressing implicit bias in the context of search and selection processes.
- 9/15–8/17 **New Faculty Program**, *University of Minnesota, Twin Cities*
Series of seminars, workshops, webinars, and personalized consultations to advance professional knowledge and skills.
- 2013 **Safe Zone Training**, *LGBT Resource Center, University of California, Irvine*
Training for informed and supportive affirmation of the LGBTQA community at UC Irvine.

Professional Society Affiliations

- American Association for the Advancement of Science
- American Association of Philosophy Teachers
- American Philosophical Association
- American Physical Society
- British Society for the Philosophy of Science
- European Philosophy of Science Association
- Friends of the SEP (Stanford Encyclopedia of Philosophy) Society
- Foundational Questions Institute (FQXi)
- History of Science Society

- Marie Curie Alumni Association
- Philosophy of Science Association
- Society of Sigma Xi