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(last updated: 25. Feb 2024)

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EDUCATION

Ludwig-Maximilians-Universität Habilitation: Dekanat der Fakultät für Philosophie, Wissenschaftstheorie und Religionswissenschaft; expected June 2024

University of Chicago Ph.D.: Department of Philosophy; June 2005
Joint Ph.D. Advisors: Prof. David Malament and Prof. Howard Stein

Harvard University A.B.: Physics and Philosophy (double major); June 1990
Philosophy Honors Thesis Advisor: Prof. Hilary Putnam
Physics Honors Thesis Advisor: Prof. Sheldon Glashow

AREAS OF SPECIALIZATION

Philosophy of Physics Quantum Field Theory on Curved Spacetime, Semi-Classical Gravity and Black Hole Thermodynamics; Spacetime Theories; Cosmology; Thermodynamics and Statistical Mechanics; Classical Mechanics; Quantum Gravity

Philosophy of Science Semantics of Theories; Scientific Knowledge and Reasoning; Methodology, Models, and Experiment; Evidence and Confirmation; Ontology; Realism and Instrumentalism; Causality

Theoretical Physics General Relativity; Quantum Field-Theory On Curved Spacetime, Semi-Classical Gravity and Black Hole Thermodynamics

AREAS OF COMPETENCE

Ancient Greek Philosophy (including the ancient Greek texts)

History of 20th Century Analytic Philosophy and Logical Empiricism

Moral Psychology/Action Theory

Philosophy of Language, Philosophical Logic

History of Physics (17th, 19th and 20th Centuries)

ACADEMIC APPOINTMENTS

Rheinische Friedrich-Wilhelms-Universität Bonn

Lichtenberg Group for History and Philosophy of Physics, Senior Researcher: Jun 2023–present

The Quantum Information Structure of Spacetime Consortium (QISS)

international research consortium (<https://www.qiss.fr/>), co-Principal Investigator (co-PI): Mar 2022–present

Ludwig-Maximilians-Universität (LMU Munich)

Munich Center for Mathematical Philosophy (MCMP), wissenschaftlicher Mitarbeiter, May 2016–Jun 2023; Postdoctoral Research Fellow, Sep 2013–Apr 2016

<https://www.mcmp.philosophie.uni-muenchen.de/people/faculty/curiel/index.html>

Harvard University

Black Hole Initiative, Distinguished Scholar: Sep 2016–present (ongoing, 4 months a year 2016–2019, 2–3 months a year 2020 onward); by invitation

<https://bhi.fas.harvard.edu/people/erik-curiel>

University of Western Ontario (UWO)

Rotman Institute for Philosophy, Postdoctoral Fellow: Sep 2010–Aug 2013

London School of Economics

Department of Philosophy, Logic and Scientific Method, Tutorial Fellow: Sep 2009–Aug 2010

University of Pittsburgh

Center for Philosophy of Science, Postdoctoral Fellow: Sep 2008–Aug 2009

HIATUS IN ACADEMIC CAREER FOR PERSONAL REASONS 2001–2008 (see section “Additional Information” at end of CV)

Stanford University

Philosophy Department, Lecturer: Sep 1998–Aug 1999; Humanities Fellow, Sep 1999–Aug 2000

University of Chicago

Philosophy Department, Lecturer: Winter Term 1997

BOOKS

Simulacra, Saturnalia and Wild Extrapolation – or – Black Hole Thermodynamics and Semi-Classical Gravity As a Way of Life, Oxford University Press, forthcoming 2024

PHILOSOPHY PUBLICATIONS

(‘++’ prefixed means ≥ 200 citations; ‘+’ ≥ 100 ; ‘***’ ≥ 75 ; ‘**’ ≥ 50 ; ‘*’ ≥ 20)

- “What Can It Mean to Ask, Why Is There Something Rather Than Nothing?”, *Zygon*, special issue “Theology and Philosophy Engage the New Cosmology: Building on the Legacy of Stephen Hawking”, R. Davies, M. A. Meyers and E. Priest (Eds.), forthcoming 2024 <<http://strangebeautiful.com/papers/curiel-what-means-something-not-nothing.pdf>>
- *“Schematizing the Observer and the Epistemic Content of Theories”, *Studies in History and Philosophy of Modern Physics*, forthcoming 2024 (Preprint: [arXiv:1903.02182 \[physics.hist-ph\]](https://arxiv.org/abs/1903.02182))
- “A Potted Early History of ‘black hole’”, appendix to Klaas Landsman, “Singularities, Black Holes, and Cosmic Censorship: A Tribute to Roger Penrose”, *Foundations of Physics*, 2021, doi:[10.1007/s10701-021-00432-1](https://doi.org/10.1007/s10701-021-00432-1)
- “Preface to Special Issue on the Philosophy of Howard Stein” (with Tom Pashby and James Weatherall), *Studies in History and Philosophy of Modern Physics*, 2020, doi:[10.1016/j.shpsb.2020.09.001](https://doi.org/10.1016/j.shpsb.2020.09.001)
- “Framework Confirmation by Newtonian Abduction”, *Synthese*, 2020, doi:[10.1007/s11229-019-02400-9](https://doi.org/10.1007/s11229-019-02400-9) (preprint: [arXiv:1804.07414 \[physics.hist-ph\]](https://arxiv.org/abs/1804.07414))
- +“Singularities and Black Holes”, *The Stanford Encyclopedia of Philosophy*, Spring 2019 Edition, Edward N. Zalta (ed.), URL = <<http://plato.stanford.edu/entries/spacetime-singularities>>
- *“On Geometric Objects, the Non-Existence of a Gravitational Stress-Energy Tensor, and the Uniqueness of the Einstein Field Equation”, *Studies in History and Philosophy of Modern Physics*, 2019, doi:[10.1016/j.shpsb.2018.08.003](https://doi.org/10.1016/j.shpsb.2018.08.003) (preprint: [arXiv:0908.3322v3 \[gr-qc\]](https://arxiv.org/abs/0908.3322v3))
- ++“A Primer on Energy Conditions”, in *Towards a Theory of Spacetime Theories*, D. Lehmkuhl, G. Schiemann, and E. Scholz (Eds.), *Einstein Studies*, Birkhäuser, 2017, doi:[10.1007/978-1-4939-3210-8_3](https://doi.org/10.1007/978-1-4939-3210-8_3) (preprint: [arXiv:1405.0403 \[gr-qc\]](https://arxiv.org/abs/1405.0403))
- *“On the Existence of Spacetime Structure”, *The British Journal for the Philosophy of Science*, 2016, doi:[10.1093/bjps/axw014](https://doi.org/10.1093/bjps/axw014) (preprint: [arXiv:1503.03413 \[physics.hist-ph\]](https://arxiv.org/abs/1503.03413)). A manuscript containing technical appendices for the constructions and arguments, and further discussion, is available at <<http://strangebeautiful.com/phil-phys.html>>.
- +“Classical Mechanics Is Lagrangian; It Is Not Hamiltonian”, *The British Journal for the Philosophy of Science*, 2014, doi:[10.1093/bjps/axs034](https://doi.org/10.1093/bjps/axs034)
- ***“Singularities and Black Holes in Relativistic Spacetimes” (with Peter Bokulich), *The Stanford Encyclopædia of Philosophy*, Fall 2012 Edition, Edward N. Zalta (ed.), URL = <<http://plato.stanford.edu/archives/fall2012/entries/spacetime-singularities/>>
- *“General Relativity Needs No Interpretation”, *Philosophy of Science*, 2009, doi:[10.1086/599277](https://doi.org/10.1086/599277)

HIATUS IN ACADEMIC CAREER FOR PERSONAL REASONS, 2001–2008 (see section “Additional Information” at end of CV)

*“Against the Excesses of Quantum Gravity: A Plea for Modesty”, *Philosophy of Science*, 2001, doi:10.1086/392926

**“The Constraints General Relativity Places on Physicalist Accounts of Causality”, *Theoria*, 2000, URL = <<http://www.jstor.org/stable/23918569>>

***“The Analysis of Singular Spacetimes”, *Philosophy of Science*, 1999, 10.1086/392720; a revised and extended version is available at <<http://strangebeautiful.com/phil-phys.html>>

PHYSICS, MATHEMATICS AND BIOLOGY PUBLICATIONS

(‘***’ prefixed means ≥ 75 citations; ‘**’ ≥ 50 ; ‘*’ ≥ 20)

“Two-Dimensional Area and Matter Flux in the Theory of Causal Fermion Systems” (with Felix Finster and José Maria Isidro), 2020, *International Journal of Modern Physics D*, doi:10.1142/S0218271820500984 (Preprint: [arXiv:1910.06161 \[math-ph\]](https://arxiv.org/abs/1910.06161))

“Summing over Spacetime Dimensions in Quantum Gravity” (with Felix Finster and José Maria Isidro), *Symmetry*, 2020, doi:10.3390/sym12010138 ([arXiv:1910.11209 \[gr-qc\]](https://arxiv.org/abs/1910.11209)). One of the journal’s “Editor’s Choice Articles” for 2020.

*“Singularities in Reissner-Nordström Black Holes” (with Paul Chesler and Ramesh Narayan), *Classical and Quantum Gravity*, 2020, doi:10.1088/1361-6382/ab5b69 (preprint: [arXiv:1902.08323 \[gr-qc\]](https://arxiv.org/abs/1902.08323)); the subject of an interview and article, “Black Hole Singularities Are As Inescapable As Expected”, by S. Nadis in the general science journal *Quanta*, <https://www.quantamagazine.org/black-hole-singularities-are-as-inescapable-as-expected-20191202/> (December 2019)

***“The Many Definitions of a Black Hole”, *Nature Astronomy*, 2019, doi:10.1038/s41550-018-0602-1 (free read-only SharedIt link: <https://rdcu.be/bfNpM>; preprint: [arXiv:1808.01507 \[gr-qc\]](https://arxiv.org/abs/1808.01507)). Reviewed in Mark Buchanan’s monthly column in *Nature Physics*, <https://www.nature.com/articles/s41567-018-0299-1>; the basis for an article in the popular science and culture magazine *Nautilus*, <http://nautil.us/blog/think-you-know-the-definition-of-a-black-hole-think-again>

“Numerical Evolution of Shocks in the Interior of Kerr Black Holes” (with Paul Chesler and Ramesh Narayan), *Physical Review D*, 2019, doi:10.1103/PhysRevD.99.084033 ([arXiv:1808.07502 \[gr-qc\]](https://arxiv.org/abs/1808.07502)); the subject of an interview and article, “Peering Inside Realistic Black Holes”, by S. Nadis in the popular science magazine *Discover*, <http://discovermagazine.com/2019/septemberoctober/taking-the-plunge> (September/October 2019)

***“ α_1 -Antitrypsin Deficiency Caused by the α_1 -Antitrypsin Null_{Mattawa} Gene” (with David Curiel, Marc Brantly, Larue Stier and Ronald Crystal), *Journal of Clinical Investigation*, 1989, doi:10.1172/JCI113994

BOOK REVIEWS

“*Structure and Reality* by Jill North (Oxford University Press, 2021)”, *Philosophical Review*, forthcoming 2023

“*Charles Peirce and Modern Science* by T. L. Short (Cambridge University Press, 2022)”, *HOPOS*, forthcoming 2023

AMERICAN MATHEMATICAL SOCIETY MATHSCINET REVIEWS

- "Finster, Felix and Kamran, Niky. 'Fermionic Fock spaces and quantum states for causal fermion systems'. Ann. Henri Poincaré, 23(2022, 4):1359–1398", forthcoming 2023
- "Tokasi, Sahand and Pickl, Peter. 'Symplectic reduction of classical mechanics on shape space'. Found. Phys. 52(2022, 5):106", forthcoming 2023
- "Salcedo, L. L. 'Nonminimal non-Abelian quantum vector fields in curved spacetime' Phys. Rev. D 106(2022, 10):105019", forthcoming 2023
- "Neznamov, V. P.; Safronov, I. I.; Shemarulin, V. E. Stationary solutions for fermions in the fields of Schwarzschild and Reissner-Nordström quantum black holes. Internat. J. Modern Phys. A 38 (2023), no. 3, Paper No. 2350019", forthcoming 2023

EDITED VOLUMES AND SPECIAL ISSUES

Working toward Solutions in Fluid Dynamics and Astrophysics: What the Equations Don't Say, E. Curiel and L. Patton (Eds.), 2023, Springer – Briefs in History of Science and Technology, doi:[10.1007/978-3-031-25686-8](https://doi.org/10.1007/978-3-031-25686-8)

Lead Guest Editor, *Synthese* topical issue, "All Things Reichenbach", 2023 (co-guest editor Flavia Padovani), <https://link.springer.com/collections/iagacieff>

Lead Guest Editor, *Studies in History and Philosophy of Modern Physics* special issue, 2020, proceedings of the conference "The Philosophy of Howard Stein", 2020 (co-guest editors Thomas Pashby and James Weatherall)

MANUSCRIPTS SUBMITTED FOR PUBLICATION

(* prefixed means ≥ 20 citations)

"Scientific Models Are Not Fictions"

*"Classical Black Holes Are Hot",

*"Measure, Topology and Probabilistic Reasoning in Cosmology"

"On the Propriety of Physical Theories as a Basis for Their Semantics"

*"Kinematics, Dynamics, and the Structure of Physical Theory"

"If Metrical Structure Were Not Dynamical, Counterfactuals in General Relativity Would Be Easy"

"Why Rigid Designation Cannot Stand on Scientific Ground"

"A Simple Proof of the Uniqueness of the Einstein Field Equation in All Dimensions"

"The Cauchy Problem in the Relativistic Theory of Electromagnetism and in the Unitary Theory of Jordan-Thiry", translation from the French, with interpretive commentary, of « Le problème de Cauchy dans la théorie relativiste dynamical evolution l'électromagnétisme et dans la théorie unitaire dynamical evolution Jordan-Thiry », Yvonne Fourès-Bruhat (later Choquet-Bruhat), in FÜNFZIG JAHRE RELATIVITÄTSTHEORIE, eds. André Mercier and Michel Kervaire, 1956, Basel: Birkhäuser, 76–78

"General Problems in Integrating the Equations of Relativity", translation from the French, with interpretive commentary, of « Problèmes généraux d'intégration de équations de la relativité », André Lichnerowicz, in FÜNFZIG JAHRE RELATIVITÄTSTHEORIE, eds. André Mercier and Michel Kervaire, 1956, Basel: Birkhäuser, 176–191

“On the Challenges the Sons of Ariston Pose to Socrates, and Socrates’ Confounding Responses”

UNPUBLISHED MANUSCRIPTS

“On Learning Philosophy”, <<http://strangebeautiful.com/papers/curiel-learning-philosophy.pdf>>

“The Delicacy of Causal Ascription and Bell’s Theorem”, <<http://strangebeautiful.com/papers/curiel-bell-delicate-caus.pdf>>

“On the Formal Consistency of Theory and Experiment, with Applications to Problems in the Initial-Value Formulation of the Partial-Differential Equations of Mathematical Physics”, <<http://strangebeautiful.com/papers/curiel-theory-experiment.pdf>>

“Nietzsche on the Living, the Dead and the Inanimate”, <<http://strangebeautiful.com/papers/curiel-nietzsche-life.pdf>>

“The Geometry of the Euler-Lagrange Equation”, <<http://strangebeautiful.com/papers/curiel-geom-ele.pdf>>

CITATION STATISTICS AND INDICES

(Feb 2024, [Google Scholar](#) + [ResearchGate](#) + [NASA/ADS](#) + [INSPIRE-HEP](#))

total citations:	994
average citations:	37
median citations:	20
h-index:	17
i10-index:	22
≥ 200 citations:	1
≥ 100 citations:	3
≥ 75 citations:	6
≥ 50 citations:	7
≥ 20 citations:	16

ERDŐS NUMBER 4

RESEARCH GRANTS (€753,460 since 2016)

Ludwig-Maximilians-Universität/Cambridge Partnership co-PI with Dr. Aron Wall (Dept. of Applied Mathematics and Theoretical Physics, Cambridge), €29,500, Dec 2022–Mar 2024: “Foundational Problems in Black Hole Thermodynamics and Semi-Classical Gravity”

Quantum Information Structure of Spacetime (QISS) co-PI for international research consortium (<https://www.qiss.fr/>), €119,000 (budget line from a €4,000,000 total project grant), Sep 2022 – Jun 2025: “Semi-Classical Gravity as a Way Station between Classical and Quantum Theories of Matter and Gravity”

Deutsche Forschungsgemeinschaft (German Research Foundation) Eigene Stelle Grant (sole PI) for €293,800, MCMP (LMU Munich), Jan 2020–Jun 2023: “Gravitation, Quantum Theory, and Thermodynamics: The Crossroads of Physics and Philosophy” (CU 338/1-2, <http://gepris.dfg.de/gepris/projekt/312032894>)

Ludwig-Maximilians-Universität/Cambridge Partnership co-PI with Dr. Jeremy Butterfield (Trinity College, Cambridge) and Dr. Aron Wall (Dept. of Applied Mathematics and Theoretical Physics, Cambridge), €12,900, Dec 2019–Mar 2023: “Foundational Problems in Black Hole Thermodynamics and Semi-Classical Gravity”

Deutsche Forschungsgemeinschaft Eigene Stelle Grant (sole PI) for €283,260, MCMP (LMU Munich), May 2016–Dec 2019: “Gravitation, Quantum Theory, and Thermodynamics: The Crossroads of Physics and Philosophy” (CU 338/1-1, <http://gepris.dfg.de/gepris/projekt/312032894>)

Ludwig-Maximilians-Universität/Cambridge Partnership co-PI with Dr. Jeremy Butterfield (Trinity College, Cambridge), €7,500, Dec 2018–Dec 2019: “Foundations of Black Hole Thermodynamics”

Erasmus Foundation International Academic Mobility Grant, €1,500 a year (2017–2021), annual 2-week Erasmus Fellowship, Università degli Studi di Firenze, Dipartimento di Lettere e Filosofia

PRIZES, HONORS, ACCOLADES

Black Hole Initiative Research Prize \$15,000 (May 2019) for “the thoughtful integration of the disciplines of both philosophy and physics” in the paper “Numerical Evolution of Shocks in the Interior of Kerr Black Holes” (with Paul Chesler and Ramesh Narayan), *Physical Review D*, 99(2019, 8):084033, [doi:10.1103/PhysRevD.99.084033](https://doi.org/10.1103/PhysRevD.99.084033)

Frontiers in Astronomy and Space Sciences editorial board, “Cosmology” section (Feb 2023)

Frontiers in Physics editorial board, “Cosmology” section (Feb 2023)

American Mathematical Society invited reviewer for *Mathematical Reviews* (Jul 2021)

International Society of Quantum Gravity membership by invitation (Jul 2021)

Universe topical editor, “Foundations of Gravitational Theories” section (Jul 2020)

Foundational Questions Institute (FQXi) membership by invitation (Mar 2016)

IOP Publishing Trusted Reviewer “consistent delivery of high quality and timely reviews” for referee work for the journals *Classical and Quantum Gravity*, *European Journal of Physics*, and *Journal of Physics Communications*

VISITING POSITIONS AND FELLOWSHIPS

Università degli Studi di Firenze Dipartimento di Lettere e Filosofia, Visiting Professor: Nov 2023

Harvard College Observatory Research Fellow: Nov 2021 – Mar 2022

Smithsonian Astrophysical Observatory Research Fellow, Radio and Geoastronomy Division (Cambridge, MA): Feb.–May 2018; Feb.–May 2019; Oct.–Nov 2020

Univ. of California, Irvine Visiting Scholar, Dept. of Logic and Philosophy of Science, Jun 2019

Università degli Studi di Firenze Erasmus Fellow, Dipartimento di Lettere e Filosofia: Mar 2017; Mar 2018; Mar 2019; Mar 2020; Mar 2021; Mar 2023; Mar 2024

Trinity College Visiting Scholar, Univ. of Cambridge, Jun.–Aug 2010

Univ. of California, Irvine Visiting Scholar, Dept. of Logic and Philosophy of Science, Jun 1999

RESEARCH AFFILIATIONS

The Center for Space, Time and the Quantum Marseilles, research fellow, Jul 2023 – present
(<http://www.spacetimeandquantum.com/>)

Center for Philosophy, Science and Policy Università Politecnica delle Marche, external member, Jul 2023 – present (<https://cpsp.univpm.it/>)

The Quantum Information Structure of Spacetime (QISS) Interdisciplinary Research Consortium
(<https://www.qiss.fr/>), co-PI, Mar 2022–present; Research Fellow, Jul 2021 – Feb 2022

Arts and Humanities Research Council (UK) and Deutsche Forschungsgemeinschaft Collaborative Research Project “The Universe As an Open System”, Univ. of Bristol and LMU Munich, Feb 2022 – Jan 2024

Next Generation Event Horizon Telescope (ngEHT) global network of physics and astrophysics departments and institutes, and radio telescope observatories: Fundamental Physics Science Working Group (SWG); Accretion Disk SWG; Photon Ring SWG; Algorithms, Inference and Visualization SWG; Aug 2021–present (<https://www.ngeht.org/>)

Center for Advanced Studies (LMU Munich) Research Focus Project “Which New Foundations for Physics?”, Jul 2021 – Jul 2023

Quantum Gravity Research Group Arnold Sommerfeld Center for Theoretical Physics (LMU Munich), Jan 2020 – Sep 2023

Bonn-Munich Working Group on History and Philosophy of General Relativity Co-Project Leader (with Prof. Dennis Lehmkuhl), Oct 2018 – Jun 2023

Causal Fermion System Global Working Group Mar 2018 – present (<https://causal-fermion-system.com/>)

Univ. of Cambridge and MCMP (LMU Munich) Collaborative Research Group “Foundations of Semi-Classical Gravity and Black Hole Thermodynamics” Co-Project Leader with Dr. Jeremy Butterfield (Trinity College, Cambridge) and Dr. Aron Wall (Dept. of Applied Mathematics and Theoretical Physics, Cambridge), Jan 2018 – Jun 2023

Deutsche Forschungsgemeinschaft Research Network “Category Theory in Philosophy of Science”, Nov 2017 – Mar 2022

Irvine-LSE-Munich-PoliMilano-Salzburg Scientific Network for Foundations of Physics MCMP Chair, Sep 2017 – Jun 2023 (<https://ilmpsnetwork.wordpress.com/>)

Arts and Humanities Research Council (UK) Research Group “Time in Quantum Gravity and Cosmology”, Univ. of Bristol, Jun 2017 – May 2020

SUMMER SCHOOLS AND EXTENDED SEMINARS

Urbino International School in Philosophy of Physics XXVII “The Philosophy of Dark Energy”: 4 lectures on foundational problems in cosmology (Urbino, Jun 2024)

LMU Munich Fakultät für Physik Summer School “Exoplanets by the Lake”: 2 lectures on the epistemology of astrophysics and realism in physics (Starnberg, Aug 2023)

Urbino International School in Philosophy of Physics xxiv “Black Holes and the Information-Loss Paradox”: 4 lectures on black hole thermodynamics, the Information-Loss Paradox, cosmic censorship (Urbino, Jun 2021)

Università degli Studi di Firenze Dipartimento di Lettere e Filosofia, Erasmus Fellow Block Seminar: “Foundations of Spacetime Theories” (Mar 2024; Mar 2023; Mar 2022; Mar 2021; Mar 2019; Mar 2018; Mar 2017)

Munich and Lausanne International Summer School in Philosophy of Physics vi “The Nature of Entropy”: 2 lectures on black hole entropy and the Information-Loss Paradox (Lenzkirch-Saig, Germany, Jul 2019)

Urbino International School in Philosophy of Physics xxii “Philosophy of Cosmology”: 4 lectures on cosmological singularities, inflation, alternative theories of gravity, the Past Hypothesis, and fine-tuning (Urbino, Jun 2019)

Munich and Lausanne International Summer School in Philosophy of Physics ii “Probabilities in Physics”: 1 lecture on probabilistic reasoning in cosmology (Lenzkirch-Saig, Germany, Jul 2014)

PHILOSOPHY OF PHYSICS TALKS 2018–PRESENT (57 talks total, 35 different talks; for older talks see [p. 25 below](#))

“Geometry, Gravity and Matter”

- Urbino International School in Philosophy of Physics xxvii “The Philosophy of Dark Energy”, Univ. of Urbino (Jun 2024)

“Energy and Entropy in Cosmology”

- Urbino International School in Philosophy of Physics xxvii “The Philosophy of Dark Energy”, Univ. of Urbino (Jun 2024)

“The Idiosyncracies of the Generalized Second Law”

- Black Hole Initiative, Harvard Univ., Colloquium (Feb 2024)

“The Peculiarities of Black Hole Entropy”

- Black Hole Initiative, Harvard Univ., Colloquium (Feb 2024)

“Energy, Entropy and the Intimate Relations between the Two in Semi-Classical Gravity”

- Université de Genève, “Beyond Spacetime” Project Colloquium (Mar 2023)
- Black Hole Initiative, Harvard Univ., Colloquium (Feb 2023)

“The Hawking Effect, Its Desiderata and Its Discontents”

- Université de Genève, Departement de Philosophie Seminar (Mar 2023)
- Black Hole Initiative, Harvard Univ., Colloquium (Feb 2023)

“Black Holes at the Center of Contemporary Theoretical Physics”

- Center for Advanced Studies (LMU Munich), Research Focus Colloquium “Foundations of Physics” (Jan 2023)

“Quantum Superpositions, Entanglement and Bell Correlations in Curved Spacetimes”

- Tel-Aviv Univ., Center for Quantum Science and Technology Conference, “The Many-Worlds Interpretation of Quantum Mechanics: Current Status and Relation to Other Interpretations” (Oct 2022)

“On Newton’s Third Rule of Reasoning in Philosophy, ‘The Universal Qualities of Bodies’, and the Speciation of Physical Systems”

- Univ. of Oxford, “Simonfest: A Conference in Honor of Simon Saunders on the Occasion of His 65th Birthday” (Oxford, Jul 2022) [missed due to illness]

“Causal Structure and the Delicacy of Holographic Arguments for Unitarity”

- MCMP Conference, “Global Structure in Semi-Classical Gravity” (LMU Munich, Jul 2022)
- Univ. of Cambridge, Cambridge/LMU Collaboration Workshop on the Foundations of Black hole Thermodynamics and Semi-Classical Gravity II (Mar 2022)
- Urbino International School in Philosophy of Physics XXIV “Black Holes and the Information-Loss Paradox”, Univ. of Urbino (Jun 2021)

“Semi-Classical Gravity as Effective Field Theory and the Information-Loss Paradox”

- Center for Advanced Studies, LMU Munich (Feb 2022)
- European Philosophy of Science Association Biennial Conference, Symposium “Philosophizing about the Unknown: Black Holes” with Emilie Skulberg, Lydia Patton, Jeroen van Dongen and Sebastian De Haro (Turin, Sep 2021)
- Urbino International School in Philosophy of Physics XXIV “Black Holes and the Information-Loss Paradox”, Univ. of Urbino (Jun 2021)
- Université de Genève, Département de Philosophie Colloquium (Oct 2020)
- Università degli Studi di Urbino Carlo Bo, Dipartimento di Scienze Pure e Applicate Colloquium (Jul 2020)
- Univ. of Oxford, Faculty of Philosophy Colloquium (May 2020)
- Munich and Lausanne International Summer School in Philosophy of Physics VI “The Nature of Entropy” (Lenzkirch-Saig, Germany, Jul 2019)

“The Virtues of Semi-Classical Gravity as a Way of Life”

- Univ. of Bonn, Lichtenberg Group for History and Philosophy of Physics, Research Seminar (Oct 2021)

“Interaction and Evolution in Quantum Mechanics”

- 20th UK and European Conference on Foundations of Physics (Paris, Oct 2021)
- Black Hole Initiative, Harvard Univ., Colloquium (Mar 2021)
- 16th International Congress of Logic, Methodology and Philosophy of Science and Technology, Triennial Conference (Prague, Aug 2019)
- MCMP, “Workshop on the Foundations of Quantum Mechanics” (LMU Munich, Jun 2018)

“A Primer on the Information-Loss Paradox”

- Urbino International School in Philosophy of Physics XXIV “Black Holes and the Information-Loss Paradox”, Univ. of Urbino (Jun 2021)

“Cosmic Censorship and Determinism in Semi-Classical Gravity”

- Urbino International School in Philosophy of Physics XXIV “Black Holes and the Information-Loss Paradox”, Univ. of Urbino (Jun 2021)
- Cambridge-LMU Research Group on Black Hole Thermodynamics and Semi-Classical Gravity, Colloquium (Mar 2021)

“Causality, Topology, Affinity, Curvature, Metric”

- Univ. of Bonn, Lichtenberg Group for History and Philosophy of Physics, Research Seminar (May 2021)

“The Dynamics of Classical Physics Determines the Structure of Newtonian Spacetime; That of Quantum Physics Does Not”

- Warsaw Univ. of Technology, International Center for Formal Ontology, Warsaw Spacetime Colloquium (Apr 2021)

“Singularities in Classical and Semi-Classical Gravity—Theory Failure or Groovy New Physics?”

- Harvard Univ., Harvard Foundations of Physics Workshop “Black Holes” (Jan 2021)
- Cambridge-LMU Research Group on Black Hole Thermodynamics and Semi-Classical Gravity, Colloquium (Jan 2021)

“Odd Models of Black Hole Evaporation, or, One Thing to Try When You Can’t Solve Equations”

- Black Hole Initiative, Harvard Univ., Colloquium (Nov 2020)

“On the Mathematical, Physical, and Conceptual Cogency of Quantum Field Theory on Curved Spacetime”

- Université de Genève and Univ. of Illinois at Chicago, “Beyond Spacetime” Project Colloquium (Apr 2020)
- Max-Planck-Institut für Wissenschaftsgeschichte, colloquium (Berlin, Jul 2019)
- Foundations of Physics 2016, The 18th UK and European Conference on Foundations of Physics (London, Jul 2016)
- British Society for Philosophy of Science, Annual Conference (Cardiff, Jul 2016)

“Two Paths to the Einstein Field Equation from Horizon Thermodynamics”

- Univ. of Cambridge, Cambridge/LMU Collaboration Workshop on the Foundations of Black Hole Thermodynamics and Semi-Classical Gravity I (Oct 2019)
- Colloquium for “Space and Time After Quantum Gravity” Project (Univ. of Illinois, Chicago, Mar 2018)
- First Annual Bristol-MCMP Workshop on Foundations of Physics, “Causal Horizons” (Bristol, Jan 2017)

“A Panopticon for Foundational Problems in Black Hole Thermodynamics and Semi-Classical Gravity”

- Univ. of Cambridge, Cambridge/LMU Collaboration Workshop on the Foundations of Black hole Thermodynamics and Semi-Classical Gravity I (Sep 2019)

“Hawking Radiation, Unruh Radiation, and the Equivalence Principle”

- European Philosophy of Science Association, Biennial Conference (Geneva, Sep 2019)

“Is Black Hole Entropy Real Entropy?”

- Munich and Lausanne International Summer School in Philosophy of Physics vI “The Nature of Entropy” (Lenzkirch-Saig, Germany, Jul 2019)

“Empiricism, Quantum Theory and the Causal Theory of Time”

- MCMP conference: “All Things Reichenbach” (LMU Munich, Jul 2019)

“Singularities in Contemporary Cosmology”

- Urbino International School in Philosophy of Physics XXII “Philosophy of Cosmology”, Univ. of Urbino (Jun 2019)

“How to Decide between Dark Matter and Alternative Theories of Gravity”

- Urbino International School in Philosophy of Physics XXII “Philosophy of Cosmology”, Univ. of Urbino (Jun 2019)

“Measure, Topology and Probabilistic Reasoning in Cosmology”

- Urbino International School in Philosophy of Physics XXII “Philosophy of Cosmology”, Univ. of Urbino (Jun 2019)

“A Survey of Foundational Problems with Inflationary Cosmology”

- Urbino International School in Philosophy of Physics XXII “Philosophy of Cosmology”, Univ. of Urbino (Jun 2019)

“What Does It Mean to Ask Whether There Is Something Rather Than Nothing?”

- Templeton Foundation Symposium “Understanding Our Place in the Cosmos: Beyond the Legacy of Stephen Hawking” (Mishkenot Sha’ananim Conference Center, Jerusalem, Mar 2019)

“What Is the Einstein Field Equation, and Why Does It Matter for Quantum Gravity?”

- Univ. of Bonn, Inst. für Philosophie Colloquium (Dec 2018)

“The Many Failures of Determinism in General Relativity and Semi-Classical Gravity”

- Black Hole Initiative, Harvard Univ., Workshop “Determinism and Indeterminism in Spacetime” (Nov 2018)

“Irreversibility in Thermodynamics and in Statistical Mechanics”

- The 19th European and UK Conference on Foundations of Physics (Utrecht, Jul 2018)

“Entropy is Modal—What’s Up with That?”

- British Society for Philosophy of Science, Annual Conference (Oxford, Jul 2018)

“Thermodynamical Irreversibility Has Nothing to Do With Temporal Asymmetry”

- MCMP, Workshop “Second Annual Joint Bristol-MCMP Workshop on the Foundations of Physics” (LMU Munich, Jan 2018)

PHILOSOPHY OF SCIENCE TALKS 2018–PRESENT

(36 talks total, 16 different talks; for older talks see [p. 28 below](#))

“What Is Dark Energy and Why Do We Need It?”

- Urbino International School in Philosophy of Physics XXVII “The Philosophy of Dark Energy”, Univ. of Urbino (Jun 2024)

“Epistemological Problems of Dark Matter”

- Urbino International School in Philosophy of Physics XXVII “The Philosophy of Dark Energy”, Univ. of Urbino (Jun 2024)

“How Maxwell’s ‘On Faraday’s Lines of Force’ Reshaped the Metaphysics of Physics and Made Relativity and Quantum Theory Possible”

- History and Philosophy of Contemporary Theoretical Physics group of the Consortium for the History of Science, Technology, and Medicine colloquium (Mar 2024, online)

“How Can Physics Bear on Ontology? Or, The Dialectical Dance of Realism and Instrumentalism”

- Philosophy Department Colloquium, Ohio State Univ. (Feb 2024)
- Boston Colloquium for Philosophy of Science, Center for Philosophy & History of Science, Boston Univ. (Feb 2020)
- MCMP Colloquium (LMU Munich, Nov 2018)
- Univ. of Barcelona, Dept. of Philosophy Colloquium (Nov 2018)
- 5th Bi-Annual South African Philosophy of Science and Logic Conference, Keynote Speaker (Rhodes Univ., Grahamstown, South Africa, Jan 2017)

“Math Does Not Represent”

- Università degli Studi di Firenze, Dipartimento di Lettere e Filosofia Colloquium (Nov 2023)
- Quantum and Computer Science Faculty, University of Oxford, QISS Consortium Conference (Jul 2023)
- Center for Advanced Studies (LMU Munich), Research Focus Colloquium “Foundations of Physics” (Apr 2023)
- London School of Economics, Sigma Club colloquium (Sep 2022)
- Univ. of Pittsburgh, Center for the Philosophy of Science Colloquium (Nov 2021)
- MCMP conference: “The MCMP Meets James R. Brown” (LMU Munich, Oct 2021)

“Schematizing the Observer and the Epistemic Content of Theories”

- QISS Consortium Colloquium (Oct 2023, online)
- Univ. of Western Ontario, Rotman Institute of Philosophy, “New Directions in Philosophy of Cosmology” Research Group Seminar (Jun 2020)
- Università degli Studi di Firenze, Dipartimento di Lettere e Filosofia Colloquium (Mar 2019)
- Univ. of Chicago conference: “The Philosophy of Howard Stein” (Jun 2017)
- MCMP, Conference “Making and Breaking Theories: Applying Physical Models” (LMU Munich, Jun 2017)

“Realism and Instrumentalism for Astrophysicists”

- LMU Munich, Fakultät für Physik Summer School: “Exoplanets by the Lake” (Aug 2023)

“Epistemology and Methodology for Astrophysicists”

- LMU Munich, Fakultät für Physik Summer School: “Exoplanets by the Lake” (Aug 2023)

“LIGO Is Not (Problematically) Theory-Laden”

- The 21st European Conference on Foundations of Physics, symposium “Theory-Testing in Past and Present Gravitational Physics” (Bristol, Jul 2023)

“On the Epistemic Import of the Mathematical Representation of Analogue Black Holes (Or, Can Dumb Holes Speak Only in Metaphor, Never Anaphor?)”

- MCMP Conference: “Mathematics and Analogical Reasoning” (LMU Munich, Jun 2022)

“Kinematics, Not Dynamics, Grounds the Modeling of Measurements”

- Conference “Measurement at the Crossroads 2020: Measuring and Modeling” (Università Cattolica del Sacro Cuore, Milan, Jun 2022)

“What to Do When You Can’t Solve Equations”

- MCMP, Colloquium (Nov 2020)
- Wichita State Univ., Philosophy Dept. workshop: “What Equations Don’t Say” (Jul 2020)

“Representation and Realism”

- Università degli Studi di Firenze, Dipartimento di Lettere e Filosofia Colloquium (Mar 2020)

“Why Rigid Designation Cannot Stand on Scientific Ground”

- MCMP Colloquium (LMU Munich, Nov 2019)
- Ninth European Congress of Analytic Philosophy, Triennial Conference (LMU, Munich, Aug 2017)
- Philosophical Society of South Africa, Annual Conference (Grahamstown, SA, Jan 2017)
- Univ. of Pittsburgh, Center for the Philosophy of Science Colloquium (Feb 2009)

“Kinematics, Dynamics, and the Structure of Physical Theory”

- Univ. of Bonn, Inst. für Philosophie Colloquium (Oct 2019)
- Philosophy of Science Association, Biennial Conference (Atlanta, Nov 2016)
- Univ. of Pittsburgh Center for Philosophy of Science, Quadrennial Fellows Conference, Plenary Session (Lund, Sweden, Jul 2016)
- MCMP conference: “The Semantics of Physical Theories” (Jun 2016)

“The Categories of Physical Systems and Theories”

- MCMP conference: “Categorical Equivalence in Philosophy of Science” (LMU Munich, Jul 2018)

“Semantics of Theories: Epistemology, Yes; Ontology, No”

- Università degli Studi di Firenze, Dipartimento di Lettere e Filosofia Colloquium (Mar 2018)
- European Philosophy of Science Association, Biennial Conference (Exeter, UK, Sep 2017)

PHYSICS AND MATHEMATICS TALKS 2018–PRESENT

(34 talks total, 23 different talks; for older talks see [p. 28 below](#))

“How Many Hawking Effects Are There?”

- Quantum Field Theory in Curved Spacetimes Workshop iii (Lisbon, Jun 2024)

“The Hawking Effect, Its Desiderata and Its Discontents”

- Deutsche Physikalische Gesellschaft (German Physics Society), Annual Conference (Berlin, Mar 2024)

“Problems with the Page-Curve Problem, Problems with Their Holographic Resolutions”

- Institute of Quantum Optics and Quantum Information Colloquium (Vienna, Apr 2023)

“Indefinite Causal Order as Change of Quantum Mechanical Q s and P s”

- Institute of Quantum Optics and Quantum Information Colloquium (Vienna, Apr 2023)

“Inconsistencies among Different Derivations of the Hawking Effect”

- Joint MCMP/Arnold Sommerfeld Center for Theoretical Physics/DAMTP Cambridge conference, “Foundations of Observational, Classical and Semi-Classical Gravitational Physics and The Problem of Agency and Laws of Nature” (Munich, Mar 2023)

“Energy, Entropy and the Intimate Relations between the Two in Semi-Classical Gravity”

- Univ. of Regensburg, Lehrstuhl for Mathematik Colloquium (Jan 2023)
- Univ. of Leipzig, Institut für Theoretische Physik conference: “Energy Conditions in Quantum Field Theory” (Sep 2022)

“Causal Structure and the Delicacy of Holographic Arguments for Unitarity”

- 25th Annual Peyresq Physics Workshop on Gravitation, Cosmology and Quantum Physics (Nicolas-Claude Fabri de Peiresc asbl., Peyresq, France, Jun 2022)

“Interaction and Evolution in Classical and Quantum Physics, and Indefinite Causal Structure”

- Institute of Quantum Optics and Quantum Information, Austrian Academy of Sciences conference: “Vienna Quantum Foundations” (Vienna, Sep 2021)

“Interaction, Evolution, Space and Time in Classical and Quantum Mechanics”

- Perimeter Inst. conference: “Quantizing Time” (Jun 2021); recorded lecture doi:[10.48660/21060123](https://doi.org/10.48660/21060123)

“Cosmic Censorship in Semi-Classical Gravity”

- Università degli Studi di Firenze, Dipartimento di Matematica e Informatica conference: “Singularity Theorems, Causality, and All That: A Tribute to Roger Penrose” (Jun 2021)

“Semi-Classical Gravity as Effective Field Theory and the Information-Loss Paradox”

- Univ. of Regensburg, Lehrstuhl for Mathematik Colloquium (Jul 2020)

“Marolf’s Boundary Unitarity Argument and Related Holography Arguments against Information Loss Beg the Causal Question”

- Perimeter Inst. conference: “2020 Quantum Gravity” (Jul 2020)

“What Is the Einstein Field Equation, and Why Does It Matter for Quantum Gravity?”

- City Univ. of Dublin, Centre for Astrophysics and Relativity Seminar (Nov 2019)
- Center for Astrophysics, Inst. for Theory and Computation Colloquium (Harvard Univ., Mar 2017)
- Max Planck Inst. for Gravitational Physics, Albert Einstein Inst. conference: “Dashed Hopes: What Hasn’t Worked in Quantum Gravity (and Why)?” (Berlin, Jul 2016)
- Radboud Univ., High Energy Physics Group, Colloquium (May 2016)

“A Survey of Foundational Problems for Classical Black Holes and the Hawking Effect”

- Center for Interdisciplinary Exploration and Research in Astrophysics colloquium, Northwestern Univ. (Evanston, IL, May 2019)

“How to Decide between Dark Matter and Alternative Theories of Gravity”

- Inst. for Theoretical Particle Physics and Cosmology, RWTH Aachen Univ. conference: “Dark Matter and Modified Gravity” (Aachen, Germany, Feb 2019)

“The Problem of the Interior for Holographic Black Holes”

- Tsinghua Univ., Yau Mathematical Sciences Center, Tsinghua Sanya International Mathematics Forum conference: “Black Holes and Holography” (Sanya, Hainan Province, China, Jan 2019)

“There Are No Translation-Invariant Borel Measures on Infinite Dimensional Fréchet Manifolds”

- Hong Kong Univ. of Science and Technology, Inst. for Advanced Study conference: “Black Holes, Inflation, and Gravitational Waves” (Hong Kong, Jan 2019)

“On the Mathematical, Physical, and Conceptual Cogency of Quantum Field Theory On Curved Spacetime”

- Tsinghua Univ., Yau Mathematical Sciences Center Colloquium (Beijing, Jan 2019)
- Max Planck Inst. for Mathematics in the Sciences conference: “Progress and Visions in Quantum Theory in View of Gravity: Bridging Foundations of Physics and Mathematics” (Leipzig, Sep 2018)
- Deutsche Physikalische Gesellschaft (German Physics Society), Annual Conference (Hamburg, Mar 2016)

“Two Paths to the Einstein Field Equation from Horizon Thermodynamics”

- Univ. of Regensburg, Lehrstuhl for Mathematik Colloquium (Dec 2018)

“Measure, Topology and Probabilistic Reasoning in Cosmology”

- City Univ. of Dublin, Centre for Astrophysics and Relativity Seminar (Dec 2018)
- Erwin Schrödinger International Inst. for Mathematics and Physics conference: “Concepts of Probability in the Sciences” (Vienna, Oct 2018)
- Univ. of Oxford, Dept. of Physics Workshop “Fine-Tuning in Cosmology” (Oxford, Oct 2017)
- Munich and Lausanne International Summer School in Philosophy of Physics II “Probabilities in Physics” (Lenzkirch-Saig, Germany, Jul 2014)

“Energy Conditions in Spacetime Theories”

- Univ. of York, Dept. of Physics conference: “Energy Conditions in Quantum Theory and Gravity” (Sep 2018)

“A Strengthened Zeroth Law for Black Hole Thermodynamics”

- Black Hole Initiative, Colloquium (Harvard Univ., Mar 2018)
- NEB-17: Recent Developments in Gravity, Hellenic Society for Relativity, Gravitation and Cosmology Annual Conference (Mykonos, Sep 2016)
- Radboud Univ., High Energy Physics Group, Colloquium (May 2016)

ANCIENT PHILOSOPHY TALKS

(6 talks total, 5 different talks)

“The Structure of Phronēsis in *Ethica Nicomachea*, Book VI”

- Univ. Of Western Ontario, Classics Dept. Colloquium (Feb 2012)
- Univ. of California, Berkeley, Committee on Ancient Philosophy Colloquium (May 2000)

“On the Challenges the Sons of Ariston Pose to Socrates in the *Republic*, Socrates’s Confounding Responses, and the Character of Justice”

- Univ. Of Western Ontario, Working Group on Ancient Philosophy Colloquium, (Jan 2011)

“Taking ‘Pleasure’ in Plato’s *Republic*”

- Univ. of California, Berkeley, Committee on Ancient Philosophy Colloquium (Feb 1999)

“On the Translation and Interpretation of Aristotle’s *Generation and Corruption*, Book II, Chapter 6”

- Midwest Ancient Philosophy Workshop (Chicago, Feb 1998)

“On the Translation and Interpretation of Aristotle’s *Generation and Corruption*, Book II, Chapter 5”

- Midwest Ancient Philosophy Workshop (Chicago, Nov 1996)

PHILOSOPHY OF COGNITIVE SCIENCE TALKS

“Possible Applications of Thermodynamical and Statistical-Mechanical Concepts of Entropy to the Study of the Brain and the Mind”

- “Mystical Entropy” Workshop, The Mystical Entropy Project, University of Leiden and the John Templeton Foundation (Amsterdam, Oct 2023)

“What Is the Entropy in the Entropic Brain Hypothesis?”

- Association for Mathematical Consciousness Science conference “Models of Consciousness” (Oxford, Sep 2023)

GENERAL PHILOSOPHY TALKS

“On the Possibility of Progress in Philosophy”

- Ludwig-Maximilians-Universität, Philosophy Faculty colloquium (Nov 2016)

“On the Use and Abuse of Scientific Examples in Philosophy”

- Univ. of Ghent, Sarton Center for History of Science Colloquium (Mar 2015)

“On Learning, Reading, and Writing Philosophy”

- Univ. of Kent, Dept. of Philosophy Colloquium (Sep 2009)

TEACHING

Ludwig-Maximilians-Universität

- **Evidence:** Summer 2022, Philosophy Faculty, graduate seminar
- **Metaphysical Problems of Physics:** Summer 2021, Philosophy Faculty, graduate seminar
- **A Survey of the Philosophy of Charles Sanders Peirce:** Summer 2020, Philosophy Faculty, graduate seminar
- **A Survey of the Philosophy of Howard Stein:** Winter 2018–19, Philosophy Faculty, graduate seminar

- **Foundations of Thermodynamics and Statistical Mechanics:** Winter 2017–18, Philosophy Faculty, graduate seminar
- **The Structure and Semantics of Scientific Theories:** Winter 2016–17, Philosophy Faculty, graduate seminar
- **The Philosophy of Space, Time and Spacetime:** Winter 2015–16, Philosophy Faculty, graduate seminar
- **The Semantics of Scientific Theories:** Summer 2015, Philosophy Faculty, graduate seminar
- **Kant and the Philosophy of Science:** Winter 2014–15, Philosophy Faculty, graduate seminar
- **Singularities and Black Holes in Relativistic Spacetimes:** Summer 2014, Physics Faculty (cross-listed, Philosophy Faculty), graduate seminar
- **Einstein for Everyone:** Summer 2014, Philosophy Faculty,

University of Western Ontario

- **Einstein for Everyone:** Spring 2013, Dept. of Philosophy, undergraduate course
- **Introduction to Ancient Philosophy:** Fall 2012, Dept. of Philosophy, undergraduate course
- **General Relativity:** Fall 2011–Spring 2012, Dept. of Physics and Astronomy (cross-listed with Dept. of Philosophy), two-term graduate course
- **Contemporary Metaphysics:** Spring 2011, Dept. of Philosophy, advanced undergraduate course
- **Philosophy of Quantum Mechanics:** Fall 2010, Dept. of Philosophy, advanced undergraduate course

London School of Economics

- **Survey of the Philosophy of Science:** Spring 2010, Dept. of Philosophy, Logic and Scientific Method, graduate course
- **Morality and Values:** (lectures on Aristotle's *Nicomachean Ethics*) Spring 2010, Dept. of Philosophy, Logic and Scientific Method, graduate course
- **Fundamental Maths for Philosophy of the Special Sciences:** Spring 2010, Dept. of Philosophy, Logic and Scientific Method, informal graduate lectures (volunteer course)
- **The Philosophical Foundations of Physics:** Fall 2009, Dept. of Philosophy, Logic and Scientific Method, graduate course
- **The History and Philosophy of Scientific Revolutions:** Fall 2009, Dept. of Philosophy, Logic and Scientific Method, advanced undergraduate course

Stanford University

- **Introduction to the Humanities:** Fall 1999–Spring 2000, Core Freshman Curriculum
- **Philosophy of Space, Time and Spacetime:** Spring 1999, Philosophy Dept., graduate and upper-level undergraduate course
- **Determinism in Physics:** Winter 1999, Philosophy Dept., graduate seminar (co-taught with Prof. Patrick Suppes)
- **Central Topics in Philosophy of Science:** Winter 1999, Philosophy Dept., upper-level undergraduate course
- **Survey of Early 20th Century Analytic Philosophy:** Fall 1998, Philosophy Dept., graduate and upper-level undergraduate course

University of Chicago

- **Philosophical and Scientific Understandings of Causation:** Winter, 1997, Committee on the Conceptual Foundations of Science, honors upper-level undergraduate seminar

STUDENT SUPERVISION

PhD Theses

- Jamee Elder** (2020) *The Epistemology of Gravitational Wave Astrophysics*, Associate Advisor (primary supervisor Prof. Don Howard), Philosophy Dept., Univ. of Notre Dame
- Juliusz Doboszewski** (2019) *Is General Relativity Indeterministic? Selected Case Studies*, External Reader (primary supervisor Dr. Hab. Jerzy Gołosz) Inst. of Philosophy, Jagiellonian Univ.
- Marina Baldiserra-Pacchetti** (2018) *Modeling, Uncertainty and Target Systems in Complex Sciences*, External Reader (primary supervisor Prof. Robert Batterman), Dept. of History and Philosophy of Science, Univ. of Pittsburgh
- Saad Anis** (2016) *On the Role of Mathematics in Scientific Reasoning*, External Reader (primary supervisor Prof. Chris Smeenk), Philosophy Dept., Univ. of Western Ontario
- Amy Wuest** (2015) *Philipp Frank: Philosophy of Science, Pragmatism, and Social Engagement*, External Reader (primary supervisor Prof. Kathleen Okruhlik), Philosophy Dept., Univ. of Western Ontario
- Jonathon Everett** (2014) *Constitutive or Regulative Principles? The Kantian Legacy for Contemporary Philosophy of Science*, External Reader (primary supervisor Prof. Michela Massimi), Dept. of Science and Technology Studies, Univ. College (London)

MA Theses

- Moody** (expected 2024) , Co-Supervisor (with Prof. Rainer Verch), Fakultät für Physik und Geowissenschaften, Univ. Leipzig
- Sara Ann Butler** (expected 2024) *Detecting Possible Dark Matter Particles with Quantum Probes*, Co-Supervisor (with Dr. Marios Christodoulou), Institute for Quantum Optics and Quantum Information, Univ. of Vienna
- Anne Deng** (2022) *Rethinking Quantum Non-Individuality: An Objection against the Metaphysical Underdetermination Argument for Ontological Structural Realism*, Supervisor, MCMP (LMU Munich)
- Sebastián Gil** (2021) *Physical Geometry and Fractal Spacetime*, Supervisor, MCMP (LMU Munich)
- Allyson (Allie) Richards** (2020) *Modeling Perception in SET with Predictive Coding*, Primary Supervisor, MCMP (LMU Munich)
- Leonardo Ortiz Acuña** (2020) *The Problem of the Arrow of Time in the Context of Special Relativity*, Supervisor, MCMP (LMU Munich)
- Alfredo García Cid** (2020) *The Meaning of Entropy in Quantum Statistical Mechanics*, Primary Supervisor, MCMP (LMU Munich)
- Alexander Niederklapfer** (2019) *Irreducible Representations as Particles in Quantum Field Theory*, Reader, MCMP (LMU Munich)
- Augusto Clot** (2019) *Philosophical Problems of Inflationary Cosmology*, Reader, Università degli Studi di Firenze, Dipartimento di Lettere e Filosofia
- Giovanni Buonocore** (2018) *A Unified Account of Realism and Anti-Realism in Physics and Biology*, Joint Primary Supervisor, Faculty of Philosophy, Univ. of Padua

Marina Baldiserra-Pacchetti (2010) *Einstein on Locality in Quantum Mechanics*, Supervisor, Dept. of Philosophy, Logic and Scientific Method, London School of Economics

MEMBERSHIP IN PROFESSIONAL SOCIETIES

International Society of Quantum Gravity by invitation (Jul 2021)

Foundational Questions Institute (FQXi) by invitation (Mar 2016)

CONFERENCE GRANTS (€115,250 for 14 conferences)

LMU Munich Center for Advanced Studies €10,000, for 2-day workshop “Towards a New Foundations for Fundamental Physics”, LMU Munich, Sep 2023

Heisenberg Programm – Deutsche Forschungsgemeinschaft (German Research Foundation) €14,000, for 4-day workshop “Foundations of Observational, Classical and Semi-Classical Gravitational Physics and The Problem of Agency and Laws of Nature”, LMU Munich, Mar 2023

Ludwig-Maximilians-Universität/Cambridge Partnership €6,000, for 4-day workshop “Foundations of Observational, Classical and Semi-Classical Gravitational Physics and The Problem of Agency and Laws of Nature”, LMU Munich, Mar 2023

Deutsche Forschungsgemeinschaft (German Research Foundation) €10,000, for international conference “Global Structure in Semi-Classical Gravity”, MCMP (LMU Munich), Jul 2022

Deutsche Forschungsgemeinschaft (German Research Foundation) €18,000, for international conference “The Quantum, the Thermal and the Gravitational Reconciled: Physics and Philosophy in the Varied Landscape of the Intersections”, MCMP (LMU Munich), Jun 2022

Ludwig-Maximilians-Universität/Cambridge Partnership €9,500, for week-long workshop “Foundational Problems in Semi-Classical Gravity and Black Hole Thermodynamics II”, Univ. of Cambridge, Mar 2022

Ludwig-Maximilians-Universität/Cambridge Partnership €5,000, for week-long workshop “Foundational Problems in Semi-Classical Gravity and Black Hole Thermodynamics I”, Univ. of Cambridge, Oct 2019

Deutsche Forschungsgemeinschaft (German Research Foundation) €12,000, for international conference “All Things Reichenbach”, MCMP (LMU Munich), Jul 2019

META, Politecnico di Milano €3,000 for international conference “Analogical Reasoning in Science”, MCMP (LMU Munich), Oct 2018

Deutsche Forschungsgemeinschaft (German Research Foundation) €5,000, for international conference “The Second Law of Thermodynamics”, MCMP (LMU Munich), Sep 2017

The Franke Institute for the Humanities (Univ. of Chicago) \$10,000 (€8,900), for international conference “The Philosophy of Howard Stein”, The Univ. of Chicago, Jun 2017

Foundational Questions Institute (FQXi) \$4,500 (€4,000), for international conference “The Philosophy of Howard Stein”, The Univ. of Chicago, Jun 2017

British Society for the Philosophy of Science £300 (€350), for First Annual Bristol-MCMP Workshop on Foundations of Physics “Causal Horizons”, Univ. of Bristol, Jan 2017

Deutsche Forschungsgemeinschaft (German Research Foundation) €9,000, for international conference “The Semantics of Scientific Theories”, MCMP (LMU Munich), Jun 2016

ORGANIZATION OF INTERNATIONAL CONFERENCES AND SYMPOSIA (not including those listed above under ‘**CONFERENCE GRANTS**’ above)

Philosophical Problems of Quantum Field Theory Third Annual Irvine-LSE-Munich-PoliMi-Salzburg Network Conference for Senior Researchers (Milan, Apr 2022, 1.5 days, co-organizer)

Philosophy and Foundations of Physics Third Annual Irvine-LSE-Munich-PoliMi-Salzburg Conference for Junior Researchers (Salzburg, Apr 2022, 1.5 days, co-organizer)

Foundations of General Relativity: From Einstein to Black Holes – Celebrating Klaas Landsman and Roger Penrose LMU/Cambridge Partnership workshop (Univ. of Cambridge, Mar 2022, 1 day, co-organizer)

Symmetry and Equivalence in Physics Second Annual Irvine-LSE-Munich-PoliMi-Salzburg Network Conference for Senior Researchers (Salzburg, Sep 2019, 1.5 days, co-organizer)

Philosophy and Foundations of Physics Second Annual Irvine-LSE-Munich-PoliMi-Salzburg Conference for Junior Researchers (Salzburg, Sep 2019, 1.5 days, co-organizer)

Black Holes and Holography Yau Mathematical Sciences Center, Tsinghua Univ. (Tsinghua Sanya International Mathematics Forum, Hainan Province, China, Jan 2019, 5 days, co-organizer)

Black Holes, Inflation and Gravitational Waves Inst. for Advanced Study, Hong Kong Univ. of Science and Technology (Hong Kong, Jan 2019, 3 days, co-organizer)

Foundational Problems of Black Holes and Gravitational Radiation MCMP (LMU Munich, Oct 2018, 2 days, lead organizer)

Problems of Time First Annual Irvine-Munich-PoliMi-Salzburg Network Conference for Senior Researchers (Salzburg, Sep 2018, 1.5 days, co-organizer)

Philosophy and Foundations of Physics First Annual First Irvine-Munich-PoliMi-Salzburg Conference for Junior Researchers (Salzburg, Sep 2018, 1.5 days, co-organizer)

The Second Annual Black Hole Initiative Conference Harvard Univ. (May 2018, 3 days, co-organizer)

Second Annual Bristol/MCMP Foundations of Physics Conference MCMP (LMU Munich, Jan 2018, 1 day, lead organizer)

Symmetries and Symmetry Breaking II MCMP (LMU Munich, Jun 2017, 1 day, co-organizer)

The First Annual Black Hole Initiative Conference Harvard Univ. (May 2017, 3 days, co-organizer)

The Foundations of Classical Field Theories MCMP (LMU Munich, Dec 2014, 1 day, co-organizer)

The Foundations of Physics Philosophy Dept. and The Rotman Inst., Univ. of Western Ontario (May 2011, 2 days, co-organizer)

SERVICE TO THE PROFESSION

Editor for Physics Journals *Frontiers in Astronomy and Space Sciences*, editorial board, “Cosmology” section; *Frontiers in Physics*, editorial board, “Cosmology” section; *Universe*, topical editor “Foundations of Gravitational Theories”

External Grant Reviewer Agence Nationale de la *Recherche* (French National Research Agency); Alexander von Humboldt-Stiftung (Alexander von Humboldt Foundation, Germany); Bundesministerium für Bildung, Wissenschaft und Forschung (Austrian Federal Ministry of Education, Science and Research); European Research Council (EU); European Research Executive Agency (EU); Fondo Italiano per la Scienza, Ministero dell'Università e della Ricerca (Italian Science Fund, Ministry of University and Research); Marie Skłodowska-Curie Fellowships (European Commission); Narodowe Centrum Nauki (Polish National Science Centre); National Science Foundation (USA); Nederlandse Organisatie voor Wetenschappelijk Onderzoek (Dutch Research Council); John Templeton Foundation

Referee for Philosophy, Physics, and Mathematics Publishing Houses Birkhäuser; Cambridge University Press; The Fields Inst. for Research in Mathematical Sciences; Oxford University Press; Radboud University Press; Springer-Verlag

Referee for Philosophy Journals *Analysis*; *Australasian Journal of Philosophy*; *The British Journal for the Philosophy of Science*; *Cybernetics and Systems*; *Dialogue*; *Ergo*; *Erkenntnis*; *European Journal for Philosophy of Science*; *Filozofia Nauki (The Philosophy of Science)*; *Foundations of Science*; *Frontiers in Psychology*; *HOPOS*; *International Studies in the Philosophy of Science*; *Journal for General Philosophy of Science*; *Kairos. Journal of Philosophy & Science*; *Mind*; *Noûs*; *Philosophical Forum*; *Philosophical Review*; *Philosophical Studies*; *Philosophies*; *Philosophy*; *Philosophy of Physics*; *Philosophy of Science*; *Qeios*; *South African Journal of Philosophy*; *Studies in History and Philosophy of Modern Physics*; *Studies in History and Philosophy of Science*; *Synthese*; *Theoria*

Referee for Physics and Mathematics Journals *AIMS Mathematics*; *Annales Henri Poincaré*; *Axioms*; *Classical and Quantum Gravity*; *Contemporary Mathematics*; *Entropy*; *European Journal of Physics*; *Foundations of Physics*; *Frontiers in Astronomy and Space Sciences*; *Galaxies*; *General Relativity and Gravitation*; *International Journal of Modern Physics D*; *International Journal of Physics Research and Applications*; *Journal of Mathematical and Fundamental Sciences*; *Journal of Physics Communications*; *Journal of Physics G: Nuclear and Particle Physics*; *Mathematical Reviews of the American Mathematical Society*; *Quantum*; *Qeios*; *Physica Scripta*; *Philosophical Transactions of the Royal Society*; *Symmetry*; *Universe*

Program Committee (Major Conferences) British Society for Philosophy of Science Annual Conference, 2017, 2019, 2020, 2021; The 19th UK and European Conference on Foundations of Physics, 2018; East European Network for Philosophy of Science Conference, 2024; Seventh International Conference on the Nature and Ontology of Spacetime, 2024

Philosophy of Science Association architect and webmaster (volunteer) for the PSA's (then) new website, <http://www.philsci.org>, Jan 2008–Jun 2009

SERVICE TO THE DEPARTMENT

MCMP (LMU, Munich)

- Chair of the Munich-Bonn History and Philosophy of Physics Research Collaboration, 2018–present
- Chair of the Irvine-LSE-Munich-PoliMi-Salzburg Scientific Network for Foundations of Physics, 2017–present
- Faculty Search Committees, 2014–present
- Visiting Fellows Committees, 2014–2017
- Colloquiums Coordinator, 2013–2015

Black Hole Initiative (Harvard University)

- Post-Doctoral Fellows Hiring Committee, 2017–present
- Visiting Fellows Coordinator, 2017–present
- Chair of the Colloquium Committee, 2017–2018
- Philosophy Workshop Coordinator, 2017–2018

Rotman Institute of Philosophy (University of Western Ontario)

- Post-Doctoral Search Committees, 2012–2013

SERVICE TO THE LOCAL COMMUNITY

Black Hole Initiative (Harvard University) organized and led philosophy reading group

MCMP (LMU, Munich) organized bi-weekly philosophy of physics reading group; program committee for many conferences hosted by the MCMP; fostering active collaborations with mathematics and physics departments

Rotman Institute of Philosophy (University of Western Ontario) organized bi-weekly philosophy of physics reading group; organized bi-weekly general philosophy of science reading group; organized weekly reading group on James Clerk Maxwell; program committee for every conference organized by the Rotman Inst.; fostered active collaborations with mathematics and physics departments

London School of Economics organized weekly reading group on Plato's **Statesman** (one in English, and a subsidiary group for Greek readers); delivered weekly informal graduate lecture series on the fundamentals of topology and real analysis

Stanford University organized weekly reading groups on Russell's **The Analysis of Matter** and Carnap's **Meaning and Necessity**; fostered active collaborations with mathematics and physics departments

PUBLIC OUTREACH AND EDUCATION

International Society for Quantum Gravity interview on my work in the foundations of quantum gravity (<https://isqg.org/>), Aug 2023

Max Planck Institut für Astrophysik public lecture "The Hawking Effect and the Information-Loss Paradox", at Black Holes and Gravitational Waves Munich Day (May 2023)

Center for Advanced Studies (LMU Munich) public lecture "Black Holes at the Center of Contemporary Theoretical Physics" (Jan 2023)

"The Daily Galaxy" science advisor (<https://dailygalaxy.com/>), Aug 2021–present

New Scientist NL science advisor (<https://www.newscientist.nl/>), Jul 2021–present

Nautilus interview by Brian Gallagher, May 2020, about my paper "What Can It Mean to Ask, Why Is There Something Rather Than Nothing?", for a forthcoming article

Every Little Thing science advisor for Gimlet media podcast (<https://gimletmedia.com/shows/every-little-thing>), Apr 2020–present

Quanta "Black Hole Singularities Are as Inescapable as Expected", interview and article by S. Nadis in the popular science magazine *Quanta*, <https://www.quantamagazine.org/black-hole-singularities-are-as-inescapable-as-expected-20191202/> (Dec 2019), about

my paper “Singularities in Reissner-Nordström Black Holes” (with Paul Chesler and Ramesh Narayan, *Classical and Quantum Gravity*, 2019, doi:[10.1088/1361-6382/ab5b69](https://doi.org/10.1088/1361-6382/ab5b69))

Discover “Peering Inside Realistic Black Holes”, interview and article by S. Nadis in the popular science magazine *Discover*, <http://discovermagazine.com/2019/septemberoctober/taking-the-plunge> (September/October 2019), about my paper “Numerical Evolution of Shocks in the Interior of Kerr Black Holes” (with Paul Chesler and Ramesh Narayan, *Physical Review D*, 2019, doi:[10.1103/PhysRevD.99.084033](https://doi.org/10.1103/PhysRevD.99.084033))

Nautilus “Think You Know the Definition of a Black Hole? Think Again”, article by Brian Gallagher in the popular online science and culture magazine *Nautilus* (<http://nautil.us/blog/think-you-know-the-definition-of-a-black-hole-think-again>), based on my paper “The Many Definitions of a Black Hole” (*Nature Astronomy*, 2019, doi:[10.1038/s41550-018-0602-1](https://doi.org/10.1038/s41550-018-0602-1))

Nature Astronomy Online Community blogger for a general audience (ongoing from Oct 2018)

University of Western Ontario public lecture “Black Holes” (Mar 2012)

London School of Economics public lecture “Singularities in General Relativity” (Oct 2009)

LANGUAGES

Ancient Greek reading (excellent)

French reading (excellent)

German reading (excellent), speaking (adequate)

Spanish reading and speaking (excellent)

REFERENCES

Dr. Jeremy Butterfield, Senior Research Fellow, Trinity College, Univ. of Cambridge, jb56@cam.ac.uk, +44 1223 338400

Prof. Carlo Rovelli, Centre de Physique Théorique de Luminy, Université de Marseille, rovelli@cpt.univ-mrs.fr, +33 (0) 6 14 59 38 85

Prof. Harvey Brown (Emeritus), Oxford Univ., Faculty of Philosophy, harvey.brown@philosophy.ox.ac.uk, +44 1865 276926

Prof. Dr. Stephan Hartmann, Ludwig-Maximilians-Universität, Munich Center for Mathematical Philosophy, Chair, S.Hartmann@lmu.de, +49 189 2180 3320

Prof. William Harper (Emeritus), Univ. of Western Ontario, Philosophy Dept., wlharp@uwo.ca, +1 519-661-2111

Prof. David Malament (Emeritus), Univ. of California, Irvine, Dept. of Logic and Philosophy of Science, dmalamen@uci.edu, +1 949-824-7374

Prof. Howard Stein (Emeritus), Univ. of Chicago, Philosophy Dept., hstein@uchicago.edu, +1 773-702-8513

Prof. Klaas Landsman, Radboud Univ., Institute for Mathematics, Astrophysics and Particle Physics, landsman@math.ru.nl, +31 24 365 2098

ADDITIONAL INFORMATION

From June of 2000 to August of 2008 I did not hold an academic position. During that time, my mother was chronically and acutely ill, and she had neither health insurance nor any other means to pay her medical bills. My academic position in 2000 at Stanford University did not pay enough for me to pay her medical bills. I therefore left Stanford and took employment in the computer industry in order to earn enough to pay her medical bills and otherwise support her. When I no longer had that obligation in 2008, I returned to academia.

PHILOSOPHY OF PHYSICS TALKS 1996–2017

(for newer talks see [p. 9 above](#))

“Continuum Spacetime as the Limit of Discrete Structure”

- Institut des Hautes Études Scientifiques, Conference “Quantum Gravity: Physics and Philosophy” (Paris, Oct 2017)

“The Problem of Approximate Symmetries in General Relativity”

- Leibniz Universität, Institut für Philosophie Conference “Symmetries in Physics” (Hannover, Jul 2017)
- Laboratoire des Recherches sur les Sciences de la Matière (CEA-Saclay), Conference “Symmetries in Physics” (Paris, Dec 2016)

“Classical Black Holes Are Hot”

- Max Planck Inst. for Radio Astronomy, Deutsche Physikalische Gesellschaft (German Physics Society) Conference “Do Black Holes Exist?—Physics and Philosophy of Black Holes” (Bad Honnef, Germany, Apr 2017)
- California Technical Inst., Division of the Humanities Colloquium (Jan 2016)
- Philosophy of Science Association, Biennial Conference (Chicago, Nov 2014)
- Univ. of Oxford, Philosophy of Cosmology Programme Conference “Philosophy of Cosmology” (Tenerife, Sep 2014)
- British Society for Philosophy of Science, Annual Conference (Cambridge, Jul 2014)
- Italian Society for Logic and Philosophy of Sciences, Triennial Conference (Rome, Jun 2014)
- NYU/Columbia/Rutgers Philosophy of Physics Group, Colloquium (New York City, Mar 2014)
- MCMP, Colloquium (Dec 2013)
- Southern California Group on the Philosophy of Physics, Colloquium, Univ. of California (Irvine, Nov 2011)
- European Philosophy of Science Association, Biennial Conference (Athens, Oct 2011)

“Why the Four-Dimensional Einstein Field Equation Is Not Equivalent to the 3+1 Canonical Representation, Plus a Few (Mostly Dismissive) Remarks about the Hole Argument”

- London School of Economics, Dept. of Philosophy, Logic and Scientific Method Workshop “The Hole Shebang: New Perspectives on the Hole Argument” (Jul 2016)

“What Is Generic and What Is Special about the Universe?”

- Hebrew Univ., Joint MCMP/Edelstein Center Conference “Probabilities in Science and Philosophy” (Jerusalem, May 2016)
- 15th Congress of Logic, Methodology and Philosophy of Science, Triennial Conference (Helsinki, Aug 2015)

“Black Holes Really Are Thermodynamical Objects”

- Trinity College (Univ. of Cambridge), Colloquium (May 2016)
- Univ. of Bristol, Depts. of Philosophy and Physics Joint Colloquium (Apr 2016)

“On the Physical and Thermodynamical Character of Cosmological Singularities”

- Philosophy of Science Association, Biennial Conference (San Diego, Nov 2012)

“On the Principle of Equivalence and the Speciation of Physical Systems”

- Univ. of Western Ontario, Philosophy Dept., Annual Philosophy of Physics Conference (Jun 2015)

“The Physical and Philosophical Significance of Energy Conditions in Spacetime Theories”

- Univ. of Oxford, Faculty of Philosophy Colloquium (Oxford, Feb 2015)

“Some Puzzles and Theorems about Newtonian Gravitational Energy”

- Rotman Inst. of Philosophy, Colloquium (London, ON, Mar 2014)

“On the Existence of Spacetime Structure”

- Univ. of Western Ontario, Philosophy Dept. Annual Philosophy of Physics Conference (May 2013)
- Carnegie Mellon Univ., Philosophy Dept. Colloquium (Jan 2009)
- Third International Conference on the Nature and Ontology of Spacetime (Montreal, Jun 2008)

“Singularities and the Cosmological Arrow of Time”

- Foundational Questions Inst. (FQXi), Conference “On Time in Physics” (Univ. of California, San Diego, May 2012)

“On the Status and Role of the Principle of Equivalence in General Relativity”

- Stanford Univ., Suppes Center for History and Philosophy of Science Colloquium (May 2012)

“Classical Mechanics Is Lagrangian; It Is Not Hamiltonian”

- Perimeter Inst. of Theoretical Physics, Colloquium, Southwestern Ontario Group on the Foundations of Physics (Waterloo, ON, Mar 2012)
- Univ. of Bristol, Colloquium, Dept. of Philosophy (Mar 2011)
- Univ. of Pittsburgh, Center for the Philosophy of Science Colloquium (Sep 2008)

“There Is No Gravitational Stress-Energy Tensor”

- Perimeter Inst. of Theoretical Physics, Southwestern Ontario Group on the Foundations of Physics Colloquium (Oct 2010)
- British Society for the Philosophy of Science, Annual Conference (Dublin, July. 2010)
- Univ. of Oxford, Faculty of Philosophy Colloquium (Nov 2009)
- The Joint Session of the Aristotelian Society and the Mind Association, Annual Conference (Norwich, Jul 2009)

“Questions about Laplacian Determinism in Newtonian Mechanics”

- Bucknell Univ., Dept. of Philosophy Colloquium (Feb 2009)

“Does General Relativity Need an Interpretation?”

- Philosophy of Science Association, Biennial Conference (Pittsburgh, Nov 2008)

“Against the Current Excesses of Quantum Gravity: A Plea for Modesty”

- Philosophy of Science Association, Biennial Conference (Vancouver, Nov 2000)

“The Analysis of Singular Spacetimes”

- Philosophy of Science Association, Biennial Conference (Kansas City, MO, Oct 1998)
- Univ. of Pittsburgh, Dept. of the History and Philosophy of Science Colloquium (Sep 1998)

“Bell’s Theorem and the Delicacy of Causal Ascription”

- Tufts Univ., Philosophy Dept. Colloquium (Jan 1999)
- American Philosophical Association, Eastern Division Annual Conference (Atlanta, Dec 1996)
- Midwest Workshop on the Foundations of Physics, Colloquium (Chicago, Mar 1996)

“Defining Gravitational Energy in Newtonian Theory and in General Relativity”

- Midwest Workshop on the Foundations of Physics, Colloquium (Chicago, Feb 1998):

PHILOSOPHY OF SCIENCE TALKS 2006–2017

(for newer talks see [p. 12 above](#))

“Newtonian Abduction (Not IBE!) as Framework Confirmation”

- Center for Advanced Studies, Conference “Reasoning in Physics” (LMU Munich, Dec 2016)

“Animadversions on the Semantic View of Theories”

- Universidad Complutense, Methods of Causal Inference and Scientific Representation Group Colloquium (Madrid, Dec 2016)
- Canadian Society for the History and Philosophy of Science, Annual Conference (Waterloo, ON, May 2012)

“Aggregating Scientific Judgements in the Absence of Empirical Data”

- Venice International Univ., Conference “Social Choice and its Philosophical Applications” (Oct 2016)

“Kinematical Constraints as Constitutive *A Priori* Components of Physical Theory”

- Univ. of Konstanz, Philosophy Faculty Conference “Neo-Kantian Perspectives on Contemporary Philosophy of Science”, (Jan 2016)

“If the Metric Were Not Dynamical, Counterfactuals in General Relativity Would Be Easy”

- European Philosophy of Science Association, Biennial Conference (Düsseldorf, Sep 2015)
- British Society for Philosophy of Science, Annual Conference (Manchester, Jul 2015)

“On Newton’s Third Rule of Reasoning in Philosophy, ‘The Universal Qualities of Bodies’, and the Speciation of Physical Systems”

- HOPOS, Annual Conference (Ghent, Jul 2014)
- Univ. of Pittsburgh Center for the Philosophy of Science, Conference “Newton and Empiricism” (Apr 2010)

“On the Propriety of Representation as a New Basis for the Semantics of Physical Theories”

- Univ. of Western Ontario, Colloquium, Dept. of Philosophy (London, ON, Jan 2012)
- Univ. of Leeds, Colloquium, Dept. of Philosophy (Mar 2011)

- London School of Economics, The Dept. of Philosophy, Logic and Scientific Method Colloquium (Nov 2009)
- The Sigma Club, Colloquium (London, Oct 2009)

PHYSICS AND MATHEMATICS TALKS 1997–2017

(for newer talks see [p. 14 above](#))

“Classical Black Holes Are Hot”

- Black Hole Initiative, Conference “First Annual BHI Conference on Black Holes” (Harvard Univ., May 2017)
- Univ. of Western Ontario, Dept. of Physics and Astrophysics Colloquium, (Mar 2012)

“A Weyl-Type Theorem in Geometrized Newtonian Gravity, and How It May Bear on Shape Dynamics”

- Perimeter Inst. of Theoretical Physics, Conference “Shape Dynamics Workshop” (Waterloo, ON, May 2017):

“48 Years of Cosmic Censorship, and Still We Do Not Know What It Is”

- Deutsche Physikalische Gesellschaft (German Physics Society) Annual Conference, Plenary Speaker (Bremen, Mar 2017)

“Black Holes Really Are Thermodynamical Objects”

- Black Hole Initiative, Colloquium (Harvard Univ., Mar 2017)
- Univ. of Oldenburg, Inst. of Physics, Mathematical Physics Colloquium (Nov 2016)

“Foundational Problems in Black Hole Thermodynamics”

- Univ. of Florence, Dept. of Physics and Astronomy Workshop “Black Holes and Thermodynamics” (Apr 2016)

“A Thermodynamical Classification of Cosmological Singularities”

- Radboud Univ., High Energy Physics Group Colloquium (Oct 2015)

“Generalizations of Lagrangian Mechanics Based on Generalizations of Tangent-Bundle Geometry”

- MCMP, Conference “Foundations of Classical Field Theory”, (Dec 2014)

“The Geometry of the Euler-Lagrange Equation”

- Univ. of Western Ontario, Dept. of Applied Mathematics Colloquium (Mar 2012)
- Deutsche Physikalische Gesellschaft (German Physics Society), Annual Conference (Bonn, Mar 2010)
- Univ. of Chicago, Physics Dept., Relativity Group Colloquium (Oct 1997)

“An Invariant Characterization of the Intrinsic Geometry of the Tangent Bundle”

- Queen Mary College, Dept. of Physics Colloquium (Jan 2010)
- Rutgers Univ., Dept. of Mathematics, Mathematical Physics Colloquium (Sep 1998)

“The Role of Configuration Space in Classical and in Quantum Mechanics”

- Pennsylvania State Univ., Dept. of Physics, Center for Gravitational Physics and Geometry Colloquium (PA, Sep 1998)