Daniel Grimmer

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Research Interests

Areas of Specialization: Philosophy of Science (Physics, Biology), Metaphysics of Space and Time, Evolutionary Epistemology, Epistemology of Artificial Intelligence, Quantum Field Theory.

Areas of Competence: Ethics of Artificial Intelligence, Philosophical Logic, Philosophy of Mathematics, Early Modern Philosophy, Thermodynamics.

Academic Employment and Education

Postdoctoral Associate and Lecturer July 2025 – Present
Yale University, New Haven CT, USA

Hertz Postdoctoral Fellowship in History and Philosophy of Physics Oct 2024 – June 2025
University of Bonn, Bonn, Germany

DPhil in Philosophy Sept 2021 – Aug 2024
University of Oxford, Oxford, UK

Thesis: *Searching for New Spacetimes: Towards a Dynamics-First View of Topology.*
Passed viva with no corrections.

MSt in Philosophy of Physics Sept 2020 – June 2021
University of Oxford, Oxford, UK

Visiting Postdoctoral Fellow, Barrio RQI Sept 2020 – May 2022
University of Waterloo, Waterloo ON, Canada

PhD in Physics (Quantum Information) Sept 2015 – Sept 2020
University of Waterloo, Waterloo ON, Canada

Thesis: *Interpolated Collision Model Formalism.*

BA in Mathematics Sept 2011 – May 2015
University of Oklahoma, Norman OK, USA

BS in Engineering-Physics Sept 2011 – May 2015
University of Oklahoma, Norman OK, USA

Manuscripts Under Review (2)

1. **Title:** Innateness In Silico At Scale: How Evolutionary Meta-Learning Repositions Neural Networks within the Nativism–Empiricism Debate
   Author: Daniel Grimmer
   Journal: Synthese (submitted Mar 2026, R&R July 2026) **Preprint:** PhilSci:30804

2. **Title:** Direct From Darwin: Deriving Advanced Optimizers From Evolutionary First Principles
Author: Daniel Grimmer
Status: Submitted May 2026; revision in preparation.
Implementation: github.com/DanielGrimmer/adam-dls **Preprint:** arXiv:2605.05284

Peer-Reviewed Publications and DPhil/PhD Theses (18)

1. **Title:** Equivalence and Determinism in Light of Topologically-Induced Structure
Authors: Daniel Grimmer, James Read
Journal: Erkenntnis (Published Sept 2026) **Preprint:** PhilSci:29119

2. **Title:** Searching for New Spacetimes: Towards a Dynamics-First View of Topology
Author: Daniel Grimmer
D.Phil. Thesis, University of Oxford (Submitted Jul 2024, Viva Aug 2024)
Outcome: Passed Viva with No Corrections

3. **Title:** Duality, Underdetermination, and the Uncommon Common Core
Authors: Daniel Grimmer, Enrico Cinti, Rasmus Jaksland
Journal: British Journal for the Philosophy of Science (Mar 2024)

4. **Title:** The Pragmatic QFT Measurement Problem and the Need for a Heisenberg-like Cut in QFT
Author: Daniel Grimmer
Journal: Synthese 202, 104 (Sept 2023) **Preprint:** arXiv:2205.09608

5. **Title:** Decoding Quantum Field Theory with Machine Learning
Authors: Daniel Grimmer, Irene Melgarejo-Lermas, José Polo-Gómez, Eduardo Martín-Martínez
Journal: Journal of High Energy Physics 2023, 031 (Aug 2023) **Preprint:** arXiv:1910.03637

6. **Title:** Measurements in QFT: Weakly Coupled Local Particle Detectors and Entanglement Harvesting
Authors: Daniel Grimmer, Bruno de S. L. Torres, Eduardo Martín-Martínez
Journal: Physical Review D 104, 085014 (Oct 2021) **Preprint:** arXiv:2108.02794

7. **Title:** The Unruh Effect in Slow Motion
Authors: Silas Vriend, Daniel Grimmer, Eduardo Martín-Martínez
Journal: Symmetry 13(11), 1977 (Oct 2021) **Preprint:** arXiv:2011.08223

8. **Title:** Dimensional Reduction of Cavities with Axial Symmetry: A Complete Analysis of When an Optical Fiber Is Approximately One Dimensional
Authors: Daniel Grimmer, Richard Lopp, Eduardo Martín-Martínez
Journal: Physical Review A 104, 013723 (Jul 2021) **Preprint:** arXiv:2104.00745

9. **Title:** Interpolated Collision Model Formalism
Author: Daniel Grimmer
Ph.D. Thesis, University of Waterloo (Sept 2020) **Preprint:** arXiv:2009.10472

10. **Title:** Collisional Quantum Thermometry
Authors: Stella Seah, Stefan Nimmrichter, Daniel Grimmer, Jader Santos, Valerio Scarani, Gabriel Landi
Journal: Physical Review Letters 123, 180602 (Oct 2019) **Preprint:** arXiv:1904.12551

11. **Title:** Zeno Friction and Antifriction from Quantum Collision Models
Authors: Daniel Grimmer, Achim Kempf, Robert B. Mann, Eduardo Martín-Martínez
Journal: Physical Review A 100, 042702 (Oct 2019) **Preprint:** arXiv:1902.07738

12. **Title:** A Classification of Markovian Fermionic Gaussian Master Equations
Authors: Marvellous Onuma-Kalu, Daniel Grimmer, Robert B. Mann, Eduardo Martín-Martínez
Journal: Journal of Physics A 52, 435302 (Oct 2019) **Preprint:** arXiv:1902.02239

13. **Title:** Thermal Contact: Mischief and Time Scales
Authors: Daniel Grimmer, Robert B. Mann, Eduardo Martín-Martínez
Journal: Journal of Physics A 52, 395305 (Sept 2019) **Preprint:** arXiv:1805.11118

14. **Title:** Gaussian Ancillary Bombardment
Authors: Daniel Grimmer, Eric Brown, Achim Kempf, Robert B. Mann, Eduardo Martín-Martínez
Journal: Physical Review A 97, 052120 (May 2018) **Preprint:** arXiv:1802.08629

15. **Title:** A Classification of Open Gaussian Dynamics
Authors: Daniel Grimmer, Eric Brown, Achim Kempf, Robert B. Mann, Eduardo Martín-Martínez
Journal: Journal of Physics A 51, 245301 (May 2018) **Preprint:** arXiv:1709.07891

16. **Title:** Purification in Rapid Repeated Interaction Systems
Authors: Daniel Grimmer, Robert B. Mann, Eduardo Martín-Martínez
Journal: Physical Review A 95, 042114 (Apr 2017) **Preprint:** arXiv:1611.07530

17. **Title:** Open Dynamics under Rapid Repeated Interaction
Authors: Daniel Grimmer, David Layden, Robert B. Mann, Eduardo Martín-Martínez
Journal: Physical Review A 94, 032126 (Sept 2016) **Preprint:** arXiv:1605.04302

18. **Title:** Quantum Phases of Dipolar Soft-Core Bosons
Authors: Daniel Grimmer, Arghavan Safavi-Naini, Barbara Capogrosso-Sansone, Şebnem Güneş Söyler
Journal: Physical Review A 90, 043635 (Oct 2014) **Preprint:** arXiv:1408.3532

Journal Refereeing

Australasian Journal of Philosophy · British Journal for the Philosophy of Science · Foundations of Physics · Annals of Physics · Physical Review Research · Physical Review A

Teaching Experience (13 Years)

Lecturer 2025 – 2027
Department of Philosophy, Yale University

Philosophy of Physics: Space, Time, and Quantum (PHIL 3333) 2026–27
Self-designed, 20 students

First-Order Logic (PHIL 1115) 2026–27
Large lecture course, 150 students

AI Epistemology and Ethics: Knowing Machine Morals (PHIL 2340) 2025–26
Self-designed, 19 students

First-Order Logic (PHIL 1115) 2025–26
Large lecture course, 121 students

Informal Research Supervision Sept 2025 –
Department of Philosophy, Yale University

Orion Shtrezi (undergraduate) — demonstrating perceptual narrowing in convolutional neural networks, within the evolutionary meta-learning programme.

Oxford terms: MT = Michaelmas (autumn), HT = Hilary (winter), TT = Trinity (spring).

Lecture Series MT 2023
Faculty of Philosophy, University of Oxford

Metaphysics of the Laws of Nature MT 2023

Self-designed, 10 students

Tutorial Teacher MT 2021 – TT 2023
Various colleges, University of Oxford

Tutored philosophy undergraduates one-on-one and in groups of up to seven; set and marked weekly 2,000-word essays and logic problem sheets; held additional office hours.

Philosophy of Time	Pembroke College, OxNet Outreach	TT 2023
Leibniz–Clarke Correspondence	Magdalen College	TT 2023
Philosophy of Mathematics	Brasenose College	TT 2023
Elements of Deductive Logic	St Hugh's College	HT 2023
Philosophy of Spacetime	Wycliffe Hall	MT 2022
Philosophy of Science	St Hilda's College	HT 2022
Introduction to Logic	Oxford Study Abroad Programme	HT 2022
Philosophy of Time	Oriel College, Academic Taster	HT 2022
Elements of Deductive Logic	Pembroke College	HT 2022
Philosophy of Spacetime	Exeter College	HT 2022
Philosophy of Science	St Catherine's College	HT 2022
Introduction to Logic	Pembroke College	MT 2021

Teaching Assistant in Philosophy MT 2022 – HT 2023
Various colleges, University of Oxford

General Philosophy	Oriel College	HT 2023
General Philosophy	St Hugh's College	MT 2022 – HT 2023

Teaching Assistant in Physics Sept 2015 – Dec 2017
University of Waterloo

Led classes of up to 30 students; set and marked exams; prepared lecture notes.

Physics 1	2015–17
Mechanics	2015–17
Electrical Engineering 1	2015–17

Quantum Physics 1	2015–17
Quantum Theory 2	2015–17

Mathematics Tutor Sept 2013 – May 2015
University of Oklahoma

One-on-one tutoring for undergraduates in the university's open-door walk-in study area. Subjects: college algebra, pre-calculus, trigonometry, calculus and analytical geometry (I–IV), differential and integral calculus (I–III), ordinary differential equations, and linear algebra.

Children's Mathematics Tutor May 2014 – Jul 2014
Mathnasium OKC

One-on-one teaching with students aged 4–18, some with dyscalculia (i.e., mathematical dyslexia). Learned to teach students of widely varying background by meeting them at their level.

Talks and Conference Presentations (Philosophy, since 2021)

How Evolutionary Meta-Learning Repositions Neural Networks in the Nativism-Empiricism Debate — Leeds, July 2026
British Society for the Philosophy of Science (BSPS)

Topological Asymmetry Neutralizes Leibniz's Shift Argument and Collapses Categorical Equivalence — Irvine CA, June 2026
Foundations of Physics, University of California, Irvine

Hausdorff and the Underdetermination of Space by Evidence — New Haven, May 2026
Felix Hausdorff Conference, Yale University

Evolutionary Epistemology In Silico: Exploring Nature and Nurture with Neural Networks — New Haven, Apr 2026
Laurie Paul's Group Meeting, Yale University

Evolutionary Epistemology In Silico: Exploring Nature and Nurture with Neural Networks — New Haven, Apr 2026
ELLMM Talk Series, Yale University

Evolutionary Meta-Learning: A New Framework for Linguistic Nativism — New Haven, Feb 2026
Computational Linguistics at Yale (CLAY)

The End of Nature vs. Nurture: Why AI Won't Inherit Our Philosophical Puzzles — New Haven, Sept 2025
P&P Meeting, Digital Ethics Center, Yale University

Undercutting the Spatiotemporal Underpinnings of the Humean Mosaic — Geneva, Dec 2024
Quantum Gravity and the Laws of Nature Workshop

Searching for New Spacetimes: The ISE Method of Topological Redescription — Bonn, Nov 2024
History and Philosophy of Physics Research Seminar, University of Bonn

What Are the Laws of Nature? And What Do They Do? — Southampton, July 2024
Surrey Summer School

In Search of New Spacetimes: The ISE Method of Topological Redescription — Oxford, May 2024
Philosophy of Physics Seminar, University of Oxford

In Search of New Spacetimes: A Dynamics-First View of Topology — Feb 2024
Job talks — Technion (Haifa), University of Bonn, and Chapman University (Orange CA)

In Search of New Spacetimes: A Dynamics-First View of Topology — Oxford, Sept 2023
Philosophy of Physics Workshop, University of Oxford

Deflating Spacetime: A Dynamics-First View of Topology — Albena, Sept 2023
Third Hermann Minkowski Meeting on the Foundations of Spacetime Physics

From Humean Laws to a Neo-Kantian Spacetime: A Dynamics-First View of Topology — Braga, Sept 2023
First International Colloquium: 'Emergence and Time'

A Dynamics-First View of Topology: Topological Redescription via the ISE Method — Bristol, July 2023
Foundations of Physics Conference 2023

In Search of New Spacetimes: Spacetime Non-Fundamentality Even for Well-Established Physics — Oxford, Feb 2023
Practice Job Talk, University of Oxford

Deflating Spacetime: A Dynamics-First View of the Spacetime Manifold — Waterloo, Jan 2023
Barrio RQI, University of Waterloo

Deflating Spacetime: A Dynamics-First View of the Spacetime Manifold — Oxford, Nov 2022
DPhil Seminar, University of Oxford

Regularity Relationism without a Manifold — London ON, June 2022
LMP 2022 Graduate Conference

The Pragmatic QFT Measurement Problem and the Need for a Heisenberg-like Cut in QFT — Online, May 2022
Quantum Field Theory on Curved Spacetime 2022

The Pragmatic QFT Measurement Problem Requires a Heisenberg-like Cut in QFT — Stockholm, May 2022
Establishing the Philosophy of Supersymmetry 2022

Two Discrete Analogs of General Covariance: Could the World Be Fundamentally Set on a Lattice? — Waterloo, April 2022
Barrio RQI, University of Waterloo

A Discrete Analog of General Covariance: Could the World Be Fundamentally Set on a Lattice? — Milan, April 2022
ILMPS 2022 — Irvine–London–Munich–PoliMi–Salzburg Conference in Philosophy and Foundations of Physics

The Pragmatic QFT Measurement Problem: A Tale of Two Detector Models — Oxford, Feb 2022
Philosophy of Physics Graduate Lunch, University of Oxford

Window to the World: America — Online, Sept 2021
Heidelberg Laureate Forum 2021

The Unruh Effect in Slow Motion — Waterloo, March 2021
RQI-Online Conference 2021

A Discrete Analog of General Covariance — Oxford, Jan 2021
Philosophy of Physics Graduate Lunch, University of Oxford

Discrete General Covariance — Waterloo, Jan 2021
Barrio RQI, University of Waterloo

Service and Governance

- **Seminar Organizer**, Graduate Student Lecture Series ("Pop-grunch"), March 2022 – January 2023.
- **Graduate Student Representative**, Humanities Division Board, University of Oxford, Sept 2020 – Oct 2021. Chair of the Graduate Joint Consultative Committee; also served on the Humanities Divisional Board, Graduate Studies Committee, Education Development Panel, and Committee for Library Provisions.
- **Director**, Board of Directors, Graduate Student Association, University of Waterloo, May 2019 – Aug 2020. A not-for-profit corporation with approximately 20 full-time employees and a $1M CAD annual operating budget. Chief Returning Officer, March – April 2019.
- **President**, Graduate Student Association, Institute for Quantum Computing, April 2018 – Oct 2019; Physics Graduate Student Association, Nov 2018 – Nov 2019.
- **Lead Conference Organizer**, Canadian Graduate Quantum Conference, 2019 and 2020.