

Daniel Grimmer

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Reuben College, Oxford, UK
Philosophy Faculty, Oxford, UK
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Research Interests:

Areas of Specialization: Philosophy of Physics, Philosophy of Science, Metaphysics, Epistemology, Quantum Field Theory, Quantum Information

Areas of Competence: Philosophical Logic, Philosophy of Mathematics, Philosophy of Artificial Intelligence, Early Modern Philosophy, Thermodynamics, General Relativity

Education and Academic Employment:

Hertz Postdoctoral Fellowship in History and Philosophy of Physics (Oct 2024 - Sept 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
Outcome: Passed with No Corrections

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

Visiting Postdoctoral Fellow at the Barrio RQI Sept 2020 - May 2022
University of Waterloo, Waterloo ON, CAN

Ph.D. in Physics - Quantum Information Sept 2015 – Sept 2020
University of Waterloo, Waterloo ON, CAN
Thesis: Interpolated Collision Model Formalism

B.A. in Mathematics Sept 2011 – May 2015
University of Oklahoma, Norman OK, USA
GPA: 3.83/4.0

B.S. in Engineering-Physics Sept 2011 – May 2015
University of Oklahoma, Norman OK, USA
GPA: 3.83/4.0

Peer-Reviewed Publications and Graduate Theses (17):

1. **Title:** Searching for New Spacetimes: Towards A Dynamics-First View of Topology
Author: Daniel Grimmer
D.Phil Thesis, University of Oxford (Submitted July 2024, Viva August 2024)

2. **Title:** Dualities, Quantum Mechanics, and the Uncommon Common Core
Authors: Daniel Grimmer, Enrico Cinti, Rasmus Jaksland
Journal: British Journal of Philosophy of Science (In Production, February 2024)
3. **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
4. **Title:** Decoding Quantum Field Theory with Machine Learning
Authors: Daniel Grimmer, Irene Melgarejo-Lermas, José Polo-Gómez, Eduardo Martín-Martínez
Journal: J. High Energ. Phys. 31: e-pg. 312023 (Aug 2023) **Preprint:** Arxiv:1910.03637
5. **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: e-pg. 085014 (Oct 2021) **Preprint:** Arxiv:2108.02794
6. **Title:** The Unruh Effect in Slow Motion
Authors: Silas Vriend, Daniel Grimmer, Eduardo Martín-Martínez
Journal: Symmetry 13(11): e-pg. 1977 (Oct 2021) **Preprint:** Arxiv:2011.08223
7. **Title:** Dimensional Reduction of Cavities with Axial Symmetry: Are Optical Fibers Really One-Dimensional?
Authors: Daniel Grimmer, Richard Lopp, Eduardo Martín-Martínez
Journal: Physical Review A 104: e-pg. 013723 (Jul 2021) **Preprint:** Arxiv:2104.00745
8. **Title:** Interpolated Collision Models Formalism
Authors: Daniel Grimmer
Ph.D. Thesis, University of Waterloo (Sep 2020) **Preprint:** Arxiv:2009.10472
9. **Title:** Collisional Quantum Thermometry
Authors: Stella Seah, Stefan Nimmrichter, Daniel Grimmer, Jader Santos, Valerio Scarani, Gabriel Landi
Journal: Physical Review Letters 123: e-pg. 180602 (Oct 2019) **Preprint:** Arxiv:1904.12551
10. **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: e-pg. 042702 (Oct 2019) **Preprint:** Arxiv:1902.07738
11. **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: e-pg. 435302 (Oct 2019) **Preprint:** Arxiv:1902.02239
12. **Title:** Thermal Contact: Mischief and Time Scales
Authors: Daniel Grimmer, Robert B. Mann, Eduardo Martín-Martínez
Journal: Journal of Physics A 52: e-pg. 395305 (Sept 2019) **Preprint:** Arxiv:1805.11118
13. **Title:** Gaussian Ancillary Bombardment
Authors: Daniel Grimmer, Eric Brown, Achim Kempf, Robert B. Mann, Eduardo Martín-Martínez
Journal: Physical Review A 97: e-pg. 052120 (May 2018) **Preprint:** Arxiv:1802.08629

14. **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: e-pg. 245301 (May 2018) **Preprint:** Arxiv:1709.07891
15. **Title:** Purification in Rapid Repeated Interaction Systems
Authors: Daniel Grimmer, Robert B. Mann, Eduardo Martín-Martínez
Journal: Physical Review A 95: e-pg. 042114 (April 2017) **Preprint:** Arxiv:1611.07530
16. **Title:** Open Dynamics under Rapid Repeated Interaction
Authors: Daniel Grimmer, David Layden, Robert B. Mann, Eduardo Martín-Martínez
Journal: Physical Review A 94: e-pg. 032126 (Sept 2016) **Preprint:** Arxiv:1605.0430
17. **Title:** Quantum Phases of Soft-Core Dipolar Bosons in Optical Lattices
Authors: Daniel Grimmer, Arghavan Safavi-Naini, Barbara Capogrosso-Sansone, Şebnem Güneş Soyler
Journal: Physical Review A 90: e-pg. 043635 (Oct 2014) **Preprint:** Arxiv:1408.3532

Papers Under Peer Review (2):

1. **Title:** Spacetime Representation Theory: Setting the Scope of the ISE Method of Topological Redescription
Author: Daniel Grimmer
Journal: (Submitted to the Philosophy of Physics Journal, August 2024) **Preprint:** Arxiv:2306.08110
2. **Title:** From Unofficially Humean Laws to an Unofficially Kantian Spacetime: Towards A Dynamics-First View of Topology
Author: Daniel Grimmer
Journal: (Submitted to Philosophical Studies, September 2024) **Preprint:** Arxiv:2308.14146

Journal Refereeing: Annals of Physics, Physical Review Research, Physical Review A.

Academic Funding Secured:

University of Oxford	Clarendon Scholarship & Oxford-Reuben Graduate Scholarship	£47,350/year x 3 years = £142,050
	The Pembroke College Alumni & Cooper Trust Scholarship	£13,200/year x 1 year = £13,200
University of Waterloo	Vanier Scholarship	\$50,000 CAD/year x 3 years = \$150,000
University of Oklahoma	OU Regents' Scholarship	\$12,650 USD/year x 4 years = \$50,600
	Astronaut Scholarship	<u>\$10,000 USD/year x 1 year = \$10,000</u>
		Total/Average: \$31,250/year x 12 years = \$375,000

Teaching Experience (Ten Years):

MT = Michaelmas Term,
HT = Hilary Term,
TT = Trinity Term

Lecture Series:

Philosophy Faculty, University of Oxford (MT 2023)

Duties: Designing the curriculum and reading list for a specially offered lectured series. Giving these lectures.

Subject: Metaphysics of the Laws of Nature

Teaching Assistant/College Tutor

Various Colleges in Oxford (see table below)

Duties: Tutoring philosophy undergraduates one-on-one and in small groups of up to 7 students.

Setting and marking the students' 2,000-word weekly essay and their logic problem sheets.

Offering additional office hours for students to discuss their work in between our regular meetings.

Subjects:

Tutorial Teacher:

	<u>Employer (College)</u>	<u>Date of Teaching</u>
- 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 2022
- 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 Session	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:

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

Teaching Assistant in Physics

University of Waterloo, Sept 2015 – Dec 2017

Duties: Leading classes of up to 30 students, setting and marking students' exams, and preparing lecture notes.

Subjects: Physics 1,
Mechanics,
Electrical Engineering 1,
Quantum Physics 1,
Quantum Theory 2.

Children's Mathematics Tutor

Mathnasium OKC, May 2014 – Jul 2014

Duties: One-on-one teaching with students aged 4-18, some with dyscalculia (i.e., mathematical dyslexia). Here I learned how to teach students with a wide variety of backgrounds by meeting them at their level.

Subjects: Counting,
Addition and Multiplication,
Fractions,
Negative Numbers,
Simple Geometric Proofs.

Mathematics Tutor

University of Oklahoma, Sept 2013 – May 2015

Duties: 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),
Introduction to Ordinary Differential Equations,
Linear Algebra.

Academic Governance and Administration:

Seminar Organizer: Graduate Student Lecture Series ("Pop-grunch")

Mar 2022 - Jan 2023

Graduate Student Representative on the committees listed below

Sept 2020 – Oct 2021

Governing Body: Humanities Division Board - University of Oxford

Committees:

- Graduate Joint Consultative Committee (**Chair**)
- Humanities Divisional Board
- Humanities Graduate Studies Committee
- Humanities Education Development Panel
- Humanities Committee for Library Provisions in Humanities

Director on the Board of Directors

May 2019 – Aug 2020

Governing Body: Board of Directors Graduate Student Association - University of Waterloo (GSA-UW)

Context: The GSA-UW is a not-for-profit corporation with approximately 20 full-time employees and an operating budget of approximately \$1 million CAD/year.

Chief Returning Officer

Mar 2019 – Apr 2019

Governing Body: Graduate Student Association - University of Waterloo (GSA-UW)

Duties: Facilitating the democratic process in which directors are elected to the Board of Directors.

Publishing the notice of election, administering the nomination process, verifying and counting the votes, and declaring the final result.

President of the Graduate Student Association

Institute for Quantum Computing - Graduate Student Association
Physics Graduate Student Association

Apr 2018 – Oct 2019
Nov 2018 – Nov 2019

Duties: Organizing social events and maintaining a sense of community amongst the graduate students.
Surveying graduate students to determine whether they were overworked as teaching assistants.

Lead Conference Organizer

Canadian Graduate Quantum Conference 2020
Canadian Graduate Quantum Conference 2019

Oct 2019 – May 2020
Oct 2018 – July 2019

Talks and Conference Presentations (Since 2021):

(See my personal website for a full list of my physics presentations prior to 2021)

- Surrey Summer School South Hampton, UK, July 2024
Title: What are the laws of nature? And what do they do?
- Oxford Philosophy of Physics Seminar Oxford, UK, May 2024
Title: In Search of New Spacetimes: The ISE Method of Topological Redescription
- Technion University Job Talk Haifa, Israel, Feb 2024
Title: In Search of New Spacetimes: A Dynamics-First View of Topology
- University of Bonn Job Talk Bonn, Germany, Feb 2024
Title: In Search of New Spacetimes: A Dynamics-First View of Topology
- Chapman University Job Talk Orange, CA, USA, Feb 2024
Title: In Search of New Spacetimes: A Dynamics-First View of Topology
- Oxford Philosophy of Physics Workshop Oxford, UK, Sept 2023
Title: In Search of New Spacetime: A Dynamics-First View of Topology
- Third Hermann Minkowski Meeting on the Foundations of Spacetime Physics Albena, Bulgaria, Sept 2023
Title: Deflating Spacetime: A Dynamics-First View of Topology
- First International Colloquium: 'Emergence and Time' Braga, Portugal, Sept 2023
Title: From Humean Laws to a Kantian Spacetime: A Dynamics-First View of Topology
- Foundations of Physics Conference 2023 Bristol, UK, July 2023
Title: A Dynamics-First View of Topology: Topological Redescription via the ISE Methodology
- Philosophy of Logic, Math and Physics Graduate Student Conference 2022 London, Canada, June 2022
Title: Regularity Relationism without a Manifold
- Quantum Field Theory on Curved Spacetime 2022 Online, May 2022
Title: The Pragmatic QFT Measurement Problem and the Need for a Heisenberg-like Cut in QFT

Establishing the Philosophy of Supersymmetry 2022

Stockholm, Sweden. May 2022

Title: The Pragmatic QFT Measurement Problem Requires a Heisenberg-like Cut in QFT

Irvine-London-Munich-PoliMi-Salzburg Conf. in Phil. and Foundations of Physics

Milan, Italy. April 2022

Title: A Discrete Analog of General Covariance: Could the world be fundamentally set on a lattice?

RQI-Online Conference 2021

Waterloo Canada. Mar 2021

Title: The Unruh Effect in Slow Motion

Contact Information for References:

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