

Daniel Grimmer

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Reuben College, Oxford, UK
Philosophy Faculty, Oxford, UK
<https://users.ox.ac.uk/~pemb6003/>

Research Interests:

Areas of Specialization: Metaphysics of Space and Time, Philosophy of Physics, Philosophy of Science, Quantum Field Theory, Quantum Information

Areas of Competence: Philosophy of Mathematics, Philosophical Logic, General Relativity, Thermodynamics

Education and Academic Employment:

DPhil in Philosophy

University of Oxford, Oxford, UK

Thesis: Deflating Spacetime: A Dynamics-First View of Topology

Supervisor: James Read

Co-Supervisor: Oliver Pooley

Sept 2021 - (June 2024)

MSt Philosophy of Physics

University of Oxford, Oxford, UK

Result: Merit

Sept 2020 - June 2021

Visiting Postdoctoral Fellow at the Barrio RQI

University of Waterloo, Waterloo ON, CAN

Supervisor: Eduardo Martín-Martínez

Duties: Research and graduate student supervision

Sept 2020 - May 2022

Ph.D. in Physics - Quantum Information

University of Waterloo, Waterloo ON, CAN

Thesis: Interpolated Collision Model Formalism

Supervisors: Eduardo Martín-Martínez and Robert Mann

Sept 2015 – Sept 2020

B.A. in Mathematics

University of Oklahoma, Norman OK, USA

GPA: 3.83/4.0

Sept 2011 – May 2015

B.S. in Engineering-Physics

University of Oklahoma, Norman OK, USA

GPA: 3.83/4.0

Sept 2011 – May 2015

Peer-Reviewed Publications (15):

1. **Title:** The Pragmatic QFT Measurement Problem and the Need for a Heisenberg-like Cut in QFT

Author: Daniel Grimmer

Journal: Synthese (Forthcoming)

Preprint: Arxiv:2205.09608

2. **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
3. **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
4. **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
5. **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
6. **Title:** Interpolated Collision Models Formalism
Authors: Daniel Grimmer
Journal: Ph.D. Thesis, University of Waterloo (Sep 2020) **Preprint:** Arxiv:2009.10472
7. **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
8. **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
9. **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
10. **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
11. **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
12. **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
13. **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

14. **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
15. **Title:** Quantum Phases of Soft-Core Dipolar Bosons in Optical Lattices
Authors: Daniel Grimmer, Arghavan Safavi-Naini, Barbara Capogrosso-Sansone, Şebnem Güneş Soyluer.
Journal: Physical Review A 90: e-pg. 043635 (Oct 2014) **Preprint:** Arxiv:1408.3532

Papers Under Peer Review (4):

1. **Title:** From Humean Laws to a Neo-Kantian Spacetime: A Dynamics-First View of Topology
Author: Daniel Grimmer
Journal: (Submitted to Philosophical Studies, August 2023) **Preprint:** Arxiv:2308.14146
2. **Title:** In Search of New Spacetimes: Topological Redescription and the ISE-Equivalence Theorem
Author: Daniel Grimmer
Journal: (Submitted to the Foundations of Physics Journal, June 2023) **Preprint:** Arxiv:2306.08110
3. **Title:** Introducing the ISE Methodology: A Powerful New Tool for Topological Redescription
Author: Daniel Grimmer
Journal: (Submitted to the Philosophy of Physics Journal, June 2023) **Preprint:** Arxiv:2303.04130
4. **Title:** Dualities, Quantum Mechanics, and the Uncommon Common Core
Authors: Daniel Grimmer, Enrico Cinti, Rasmus Jakslund
Journal: (Submitted to the British Journal of Philosophy of Science, June 2023)

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

Talks and Conferences Presentations (Since 2021):

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

- 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?

Heidelberg Laureate Forum 2021 Online. Sept 2021
Title: Window to the World: America

RQI-Online Conference 2021 Waterloo Canada. Mar 2021
Title: The Unruh Effect in Slow Motion

Academic Funding Secured:

University of Oxford Clarendon Scholarship £47,350/year x 3 years = £142,050
& Oxford-Reuben Graduate Scholarship

The Pembroke College Alumni £13,200/year x 1 year = £13,200
& Cooper Trust Scholarship

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 \$10,000 USD/year x 1 year = \$10,000

Total/Average: £25,561/year x 12 years = £306,700

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.

Lead Conference Organizer

Conference: Canadian Graduate Quantum Conference 2020 Oct 2019 – May 2020

Conference: Canadian Graduate Quantum Conference 2019 Oct 2018 – July 2019

Teaching Experience (Ten Years):

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

Upcoming Lecture Series:

Subject: Metaphysics of the Laws of Nature Philosophy Faculty, University of Oxford (MT 2023)

Duties: Developing a series of 1-hour lectures and an accompanying syllabus and reading list.

Teaching Assistant/College Tutor

Various Colleges in Oxford (see table below)

Subject: Various Subjects (see table below)

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

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

Offering additional office hours for students in between our regular meetings.

Tutorial Teacher:

- Philosophy of Time
- Leibniz Clarke Correspondence
- Philosophy of Mathematics
- Elements of Deductive Logic
- Philosophy of Spacetime
- Philosophy of Science
- Introduction to Logic
- Philosophy of Time
- Elements of Deductive Logic
- Philosophy of Spacetime
- Philosophy of Science
- Introduction to Logic

Employer (College)

Pembroke College, OxNet Outreach
Magdalen College
Brasenose College
St. Hugh's College
Wycliffe Hall
St. Hilda's College
Oxford Study Abroad Programme
Oriel College, Academic Taster Session
Pembroke College
Exeter College
St. Catherine's College
Pembroke College

Date of Teaching

TT 2023
TT 2023
TT 2023
HT 2022
MT 2022
HT 2022
HT 2022
HT 2022
HT 2022
HT 2022
HT 2022
HT 2022
MT 2021

Teaching Assistant:

- General Philosophy
- General Philosophy

Oriel College
St. Hugh's College

HT 2023
MT 2022 - HT 2023

Teaching Assistant in Physics

University of Waterloo, Sept 2015 – Dec 2017

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

Duties: Led classes of up to 30 students, marked students' exams, and prepared lecture notes.

Mathematics Tutor

University of Oklahoma Sept 2013 – May 2015

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.

Duties: One-on-one tutoring for undergraduates in the university's open-door walk-in study area.