Isaac Wilhelm

CV as of May, 2020

Rutgers University
106 Somerset St., 5th floor
New Brunswick, NJ 08901

isaac.wilhelm@rutgers.edu
765-277-1274
isaacwilhelm.com

EDUCATION

Rutgers University

Ph.D. Philosophy — Expected 2021

- Dissertation: "Explanation".
- Committee: Barry Loewer (co-chair), Jonathan Schaffer (co-chair), David Albert, Karen Bennett, Jill North, Ted Sider, Michael Strevens (external).

M.S. Mathematics — 2016-18

- Thesis: "Typical: A Theory of Typicality and Typicality Explanation".
- Committee: Sheldon Goldstein (chair), Michael Kiessling, Joel Lebowitz.

Tufts University

M.A. Philosophy — 2013-15

University of Chicago

B.A./B.A. Mathematics, Cinema and Media Studies (both honors) — 2007-11

INTERESTS

AOS: metaphysics, philosophy of science, philosophy of physics.

AOC: epistemology (traditional and formal), feminist philosophy, logic, philosophy of biology, philosophy of mathematics.

Teaching competence: bioethics.

PUBLICATIONS

Forthcoming — **Explanatory Priority Monism**
Philosophical Studies.

Forthcoming — **Grounding and Propositional Identity**
Analysis.

Forthcoming — **Interventionist Explanation and the Problem of Single Variable Boundary Constraints**
Noûs.

Forthcoming **The Stage Theory of Groups**
Australasian Journal of Philosophy.

Forthcoming **An Argument for Entity Grounding**
Analysis.

Forthcoming **Typical: a Theory of Typicality and Typicality Explanation**
The British Journal for the Philosophy of Science.

- Featured in the OUP "Best of Philosophy 2019" article collection.

Forthcoming **The Logic of Typicality**
In Valia Allori, ed., *Statistical Mechanics and Scientific Explanation: Determinism, Indeterminism and Laws of Nature.* World Scientific. (with Harry Crane)

2019 **Celestial Chaos: The New Logics of Theory-Testing in Orbital Dynamics**
Studies in History and Philosophy of Modern Physics 65: 97-102.

2019 **The Ontology of Mechanisms**
The Journal of Philosophy 116: 615-636.

2018 **A Statistical Analysis of Luck**
Synthese doi: 10.1007/s11229-018-1745-4.

2018 **New Data on the Representation of Women in Philosophy Journals: 2004-2015**
Philosophical Studies 175: 1441-1464. (with Sherri Conklin and Nicole Hassoun)

2018 **The Representation of Belief**
Journal of Philosophical Logic 47: 715-732.

WORKS IN PROGRESS OR UNDER REVIEW

"Centering the Principal Principle" (under review).

"Gender is Essential to Some, But Not All, Individuals" (under review).

"Fine-Grained Propositions and the Russell-Myhill Argument" (in progress).

PRESENTATIONS (SELECTED)

"Linguistic Ersatzism and the Upper Bound Problem"
- Joint Session, University of Kent, July 2020.

"Centering the Principal Principle"
- Eastern APA (symposium), Philadelphia PA, January 2020.
- Philosophy of Physics Workshop, CCNY, May 2019 (invited).

"The Big Bang, Fine Tuning, and the Existence of God"
- Look at Life, Richmond IN, April 2019 (invited).

"Typical"
- Eastern APA (symposium), New York NY, January 2019.
- Munich Center for Mathematical Philosophy, June 2018 (invited).

"Climate Surveying" (with Savannah Kincaid)
- Eastern APA, Skill Building and Improving the Profession MAP session, New York NY, January 2019.

"Explanatory Priority Monism"
- Central APA (colloquium), Denver CO, February 2019.
- FraMEPhys Workshop on Explanatory Pluralism, University of Birmingham, June 2018 (invited).

"Comparative Structure"
- Canadian Society for the History and Philosophy of Science, University of Regina, May 2018.
- Society for Exact Philosophy, University of Connecticut, May 2018.
- Eastern APA (colloquium), Savannah GA, January 2018.
- British Society for the Philosophy of Science, Edinburgh, July 2017.

"The Ontology of Mechanisms"
- Society for the Metaphysics of Science, Toronto, November 2019.
- Composition Workshop, Rutgers, May 2018 (invited).
- Rutgers-Bochum Workshop, April 2018 (invited).

"Intrinsicality and Quantum Entanglement"
- Fifth International Summer School in the Philosophy of Physics, Saig, July 2017.
- Canadian Philosophical Association, Toronto, May 2017.

"Lawhood and Calculational Tractability"
- Pacific APA (colloquium), Seattle WA, April 2017.
- Western Canadian Philosophical Association, University of Alberta, October 2016.

"Sufficient and Necessary Conditions for Representability"
- NASSLLI, Rutgers University, July 2016.

"Chaos Regained: On the Possibility of a New Era of Orbital Dynamics"
- Society for the Philosophy of Science in Practice, Rowan University, June 2016.
- History of Philosophy of Science Conference, University of Minnesota, June 2016.
- Tufts University, July 2015.

"Quantity, Property, and Fundamental Law"
- The Metaphysics and Epistemology of Grounding and Fundamentality, CUNY, December 2015.

COMMENTS

"Constraining Inductive Metaphysical Inferences by Help of Internal Unification", Kian Salimkhani, Society for the Metaphysics of Science, New York, October 2017.

"Grounding, Dependence and Mathematical Explanation", Bill D'Alessandro, Eastern APA, Baltimore, January 2017.

GRANTS AND AWARDS

SCP-Templeton Graduate Fellowship for Cross-Training in Physics ($30,000)	2017-18
Rutgers Excellence Fellowship for Doctoral Studies	2015-17
Summer Special Studies Award (x2)	2016-17
Rutgers Conference Travel Award (x4)	2016-19
Kartemquin Labs Film Screening Review	2013
Fire Escape Films: Travel Grant	2012
Chicago Filmmakers Sponsorship Grant	2012
Seidel Scholars PRISM Grant for Film Equipment (co-recipient)	2011

TEACHING

Teacher Training Certificate Spring 2019

- Completed a training program on philosophy pedagogy and classroom management.

University Teaching

- Instructor
  - Introduction to Formal Reasoning and Decision-Making (online) Summer 2020
  - Introduction to Formal Reasoning and Decision-Making Fall 2019
  - Bioethics (online) Summer 2019
  - Introduction to Philosophy of Science Spring 2019
  - Introduction to Philosophy Summer 2018
    - Part of the New Jersey Educational Opportunity Fund, which supports students from disadvantaged backgrounds.
- Teaching Assistant
  - Introduction to Philosophy, Ted Sider Fall 2018
  - Graduate Logic, George Smith (Tufts) Fall 2014
  - Undergraduate Logic, Susan Russinoff (Tufts) Spring 2014
  - Calculus, Diane Herrmann (Chicago) 2008-10
- Grader
  - Applied Symbolic Logic, Anthony Gillies Spring 2020
  - Intermediate Logic I, Ted Sider Spring 2019
  - Applied Symbolic Logic, Ted Sider Fall 2017

- Intermediate Logic, Anthony Gillies — Spring 2016

Grade School Teaching (select courses; see my website for full list)

- Instructor
  - Young Scholar's Program (Chicago) — 2008-10
  - Saturday Program for Gifted Youth (Northwestern)
    - Set Theory — Spring 2013
    - Paradigm Shifts in Science — Fall 2012
    - Game Theory and Probability — Fall 2012
    - Statistics — Fall 2011
  - Summer Program for Gifted Youth (Northwestern)
    - Documentary Filmmaking — 2014
    - Prove It! Math and Multimedia Proof — 2013
- Teaching Assistant
  - SESAME: Adult Mathematics Education (Chicago) — Summer 2010
    - Taught new instructional methods to grade school teachers.

Dark Foan Education — 2011-13

Founded a tutoring business that offered one-on-one instruction to grade school students at the University of Chicago Laboratory Schools. Worked personally with 22 students, 18 of whom were with me for at least a full academic year.

Non-Credited Courses in Mathematics (for Philosophers) — 2017-19

I organized and ran tutorials on topics in mathematics. These tutorials met multiple times, and they were attended by both professors and graduate students.

- The Russell-Myhill Paradox — Spring 2019
- Introduction to Measure Theory — Fall 2018
- Introduction to Category Theory — Summer 2017

SERVICE

Climate Committee, Rutgers Philosophy Department — 2015-20

- Organized three departmental climate surveys.
- Organized the Rutgers Undergraduate Philosophers Mentorship program.

Managing Editor — 2019-20

- Oxford Studies in Philosophy of Religion, Volume 9.
- Oxford Studies in Metaphysics, Volume 12.

Marc Sanders Prizes — 2019-20

- Organizer for the Sanders Prize in Philosophy of Religion.
- Organizer for the Sanders Prize in Metaphysics.

Referee — 2017-20

- Analysis, Erkenntnis, Philosophical Studies (x2), Philosophy of Science, Statistical Science, Theoria.

Metro Area Philosophy of Science (MAPS) 2017-19

- Organized three to five talks for the MAPS group each semester.

Rutgers-Columbia Workshop: Quantum Field Theories 2018

- Co-organized a two-day international workshop on the philosophy of QFT.

MAPS Pre-Workshop Workshop 2018

- Organized an international workshop on structure in physics.

Philosophy of Science Reading Group 2016-18

- Organized the Rutgers philosophy of science reading group.

Filming and Editing 2016-18

- Foundations of Probability Seminar.
- Metaphysics of Fine Tuning Conference.
- Center for Philosophy of Religion, Marc Sanders Lectures.

Data Collection on Representation of Women in Philosophy 2016

- Project to determine proportion of journal publications by women.

FILM PRODUCTION

Sanders Lectures: 2017, 2018

2018 (Fall). 2 hours; credited as editor. Published online.
2018 (Spring). 2 hours; credited as editor. Published online.
2017. 2 hours; credited as editor. Published online.

Luke Barnes on Fine Tuning, Rutgers Philosophy of Religion 2017

2 hours; credited as editor: audio and video recording of Luke Barnes' 2017 lecture on fine tuning, sponsored by the Rutgers Center for the Philosophy of Religion. Published online.

Newton's Principia

75 hours; 2015; credited as editor: audio and video recording of a two-semester course on the science and philosophy of Newton's *Principia*. To be published online.

American Diner

105 minutes; 2013; credited as director, DP, editor: a documentary about three small-town diners. Screenings: Kartemquin, Chicago; Doc Films, Chicago.

The Point

15 minutes; 2011; credited as director, sound producer, DP, editor: a documentary about Promontory Point. Screenings: Film Studies Center, University of Chicago.

GRADUATE COURSEWORK

Metaphysics

- Advanced Topics in Metaphysics (Barry Loewer, Jonathan Schaffer)
- Advanced Topics in Metaphysics (Karen Bennett; audit)
- Aristotle's Metaphysics (Tufts: Christiana Olfert, George Smith)
- Chance and Causation (Princeton: Adam Elga, Boris Kment; audit)
- Explanation (Jonathan Schaffer)
- Explanation Across Disciplines (NYU: Laura Franklin-Hall, Michael Strevens; audit)
- Higher-Order Metaphysics (Ted Sider; audit)
- Objects (Tufts: Jody Azzouni)
- Structuralism in the Metaphysics of Science (Ted Sider; audit)
- The Nomological (Jonathan Schaffer, Ted Sider, John Hawthorne; audit)
- The Philosophy of David Lewis (Tufts: David Denby)
- Truth (Tufts: Jody Azzouni)

Philosophy of Science and Philosophy of Physics

- Advanced Topics in Philosophy of Physics: Space and Time (Jill North)
- Advanced Topics in Philosophy of Physics: Spacetime (David Albert)
- Advanced Topics in Philosophy of Physics: Time (David Albert)
- Advanced Topics in Philosophy of Quantum Mechanics (David Albert; audit)
- Evolution of Mind and Morals (Tufts: Patrick Forber)
- Newton's *Principia* (Tufts: George Smith)
- Philosophy of Quantum Mechanics (David Albert)
- Philosophy of Quantum Mechanics (Jill North, Ted Sider)
- Science Before Newton's *Principia* (Tufts: George Smith)
- Spacetime (NYU: Tim Maudlin; audit)

Logic and Philosophy of Mathematics

- Computation Theory (Tufts: George Smith)
- Formal Methods (Anthony Gillies; audit)
- Independent Study: Advanced Topics in Philosophy of Mathematics (Harvard: Peter Koellner, Hugh Woodin)
- Logic (Tufts: George Smith)
- Modal Logic (Tufts: Dilip Ninan)

Courses in Mathematics Department

- Abstract Algebra I (Vladimir Retakh)
- Algebraic Topology (Feng Luo)
- Foundations of Probability I (Harry Crane)
- Foundations of Probability II (Harry Crane)

- Seminar on the Foundations of Probability I (Harry Crane)
- Seminar on the Foundations of Probability II (Harry Crane; audit)
- Statistical Mechanics I: Equilibria (Joel Lebowitz)
- Statistical Mechanics II: Non-Equilibria (Joel Lebowitz)
- Theory of Functions of a Real Variable I (Daniel Ocone)
- Typicality in Physics (Sheldon Goldstein)

Other Philosophy Courses

- Advanced Topics in Epistemology (Ernest Sosa; audit)
- Advanced Topics in Philosophy of Language (Jeff King)
- Dissertation Seminar (Alex Guerrero)
- Independent Study: Representation and Fragmentation (Andy Egan, Adam Elga, Augustín Rayo)
- Kant's Theoretical Philosophy (Chicago: Thomas Land)
- Proseminar (Frances Egan, Brandon Fitelson)
- Third Year Seminar (Ruth Chang)

DISSERTATION ABSTRACT

How do all the different explanatory relations—causation, grounding, and so many others—back explanations? Do causal, metaphysical, and mathematical explanations share a common, unified structure? Or are these different kinds of explanations fundamentally disunified?

I argue for their unity. In particular, I argue that there is a single 'explanatory determination' relation which (i) backs all cases of explanation, and (ii) explains why all other explanation-backing relations are explanatory. The explanatory determination relation can be used to overcome a series of explanatory challenges. It also accounts for the epistemic unity of explanation, and it can be enveloped in the formalism of structural equation models.

In addition, I investigate explanation in specific disciplines, focusing in particular on science and mathematics. In my discussion of scientific explanation, I argue that typicality facts—for instance, the fact that gases typically evolve to equilibrium—can be explanatory. I analyze the notion of typicality, I propose an account of how typicality facts explain, and I argue that typicality is not the same thing as probability. This part of my dissertation is forthcoming in *The British Journal for the Philosophy of Science*.

In my discussion of mathematical explanation, I formulate a theory of what makes some proofs at least as explanatory as others. I propose a formalism for that 'at least as explanatory as' relation among mathematical proofs, and I discuss two accounts of it. One account takes that relation to be primitive. The other analyzes it in terms of various properties that proofs possess: roughly, one proof is more explanatory than another just in case the former strikes a better balance between simplicity and structural depth – that is, the extent to which the proof illuminates mathematical structures – than the latter.