

Isaac Wilhelm

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EDUCATION

Rutgers University

- Ph.D. Philosophy Expected 2020
- Dissertation: “Essays on Explanation”.
 - Committee: Barry Loewer (co-chair), Jonathan Schaffer (co-chair), David Albert, Karen Bennett, Jill North, Theodore 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

Areas of specialization: metaphysics, philosophy of science, philosophy of physics.

Areas of competence: epistemology (traditional and formal), feminist philosophy, philosophy of biology, logic.

Teaching competence: bioethics, calculus, analysis.

PUBLICATIONS

- Forthcoming **The Ontology of Mechanisms**
The Journal of Philosophy.
- Forthcoming **Interventionist Explanation and the Problem of Single Variable
Boundary Constraints**
Noûs.
- Forthcoming **Typical: a Theory of Typicality and Typicality Explanation**
The British Journal for the Philosophy of Science.

- 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.
- 2018 **A Statistical Analysis of Luck**
Synthese, doi: 10.1007/s11229-018-1745-4.
- 2018 **The Representation of Belief**
Journal of Philosophical Logic, 47, 715-732.
- 2018 **New Data on the Representation of Women in Philosophy Journals: 2004-2015**
Philosophical Studies, 175, 1441-1464 (with Sherri Conklin and Nicole Hassoun).

WORKS IN PROGRESS OR UNDER REVIEW

“Centering the Principal Principle”: I show that centered propositions generate a problem for the Principal Principle, and I suggest a solution.

“The Ontology of Groups”: I argue that groups are fusions of pluralities (indexed to worlds and times), and I analyze the notion of a social group.

“Gender is Essential to Some, But Not All, Individuals”: I argue that some individuals have their genders essentially while others do not.

PRESENTATIONS (SELECTED)

“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”

- Composition Workshop, Rutgers, May 2018 (invited).
- Rutgers-Bochum Workshop, April 2018 (invited).

“Intrinsicity and Quantum Entanglement”

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

“Lawhood and Computational 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 Salmikhani, 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

Cross-Training Fellowship (\$30,000)	2017-18
Rutgers Excellence Fellowship	2015-17
Special Studies Award (x2)	2016-17
Rutgers Conference Travel Award (x4)	2016-19
Kartemquin Labs Review	2013
Fire Escape Films: Travel Grant	2012
Chicago Filmmakers Sponsorship Grant	2012
Seidel Scholars PRISM Grant (co-recipient)	2011

TEACHING

Teacher Training Certificate Spring 2019

- Took courses on philosophy pedagogy and classroom management.

University Teaching

- Instructor

- Bioethics (online course) Summer 2019
- Introduction to Philosophy of Science Spring 2019
- Introduction to Philosophy Summer 2018
 - Part of the Educational Opportunity Fund (EOF).
 - EOF 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 (UChicago) 2008-10

- Grader

- 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 (UChicago) 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 (UChicago) 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.

Unofficial Courses in Mathematics (for Philosophers) 2017-19

- Russell-Myhill paradox, spring 2019: for professors and grad students.
- Measure theory intro, fall 2018: for professors and grad students.
- Category theory intro, summer 2017: for professors and grad students.

SERVICE

- Climate Committee, Rutgers Philosophy Department 2015-20
- Organized three departmental climate surveys.
 - Organized the Rutgers Undergraduate Philosophers Mentorship program.
- Metro Area Philosophy of Science (MAPS) 2017-19
- Organized three to five talks for the MAPS group each semester.
- Referee 2017-19
- Analysis, Erkenntnis, Theoria, Statistical Science.
- 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; 2017; 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)
- Explanation (Jonathan Schaffer)
- Advanced Topics in Metaphysics (Karen Bennett; audit)
- The Nomological (Jonathan Schaffer, Ted Sider, John Hawthorne; audit)
- Structuralism in the Metaphysics of Science (Ted Sider; audit)
- Explanation Across Disciplines (NYU: Laura Franklin-Hall, Michael Strevens; audit)
- Chance and Causation (Princeton: Adam Elga, Boris Kment; audit)
- Objects (Tufts: Jody Azzouni)
- Truth (Tufts: Jody Azzouni)
- The Philosophy of David Lewis (Tufts: David Denby)
- Aristotle's Metaphysics (Tufts: Christiana Olfert, George Smith)

Philosophy of Science and Philosophy of Physics

- Advanced Topics in Philosophy of Physics: Time (David Albert)
- Advanced Topics in Philosophy of Physics: Space and Time (Jill North)
- Philosophy of Quantum Mechanics (David Albert)

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

Logic and Philosophy of Mathematics

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

Courses in Mathematics Department

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

Other Philosophy Courses

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

DISSERTATION ABSTRACT

My dissertation lays the foundations for a unified theory of explanation. To start, I propose and defend an account of how all explanatory relations—causation, grounding, and others

too—back explanations. I argue that there is a single ‘explanatory determination’ relation which (i) backs all cases of explanation, and (ii) explains why those other explanation-backing relations—like causation and grounding—are explanatory.

In the rest of the dissertation, 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. This is a theory of the ‘at least as explanatory as’ relation among mathematical proofs. I propose a formalism for that relation, and I discuss two accounts of it: one takes that relation to be primitive, and the other analyzes it in terms of various properties that proofs possess.