

# Zachary Hall

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## Education

PhD in Philosophy, Stanford University (expected June 2026)

Dissertation Title: Undertheorized Aspects of Spin-Gravity Coupling

Abstract: My dissertation brings out that the way the gravitational field and spin or intrinsic angular momentum dynamically relate to one another is significantly undertheorized by showing that there are *prima facie* many such couplings internally consistent and consistent with quantum field theory (QFT) and general relativity (GR). To show this, I first identify open empirical questions associated with such coupling. I then show that the Mathisson-Papapetrou-Dixon equations that model how macroscopic spinning objects couple to the gravitational field in GR do not bear on the issue despite the pervasive belief that they do by attention to an idealization inherent in them responsible for this belief. I also show that the “minimal coupling” procedure provides no *a priori* constraints on such theorizing. As an aside, I provide a new reconstruction of Bohr’s account of measurements of position and momentum (This is ultimately relevant for theorizing spin through theorizing measurements of spin, and Bohr’s account suggests ready generalization to this theoretical context.) Lastly, I consider whether and, if so, in what sense we should expect a successful theory of spin-gravity coupling to be background independent.

Patrick Suppes Fellow in the Philosophy of Science, September 2018-June 2023

Patrick Suppes Dissertation Fellow, September 2023-June 2024

B.A. in Astronomy & Physics and in Philosophy, Boston University, 2017. *Summa Cum Laude*

GPA: 3.99/4.00

College Prize for Excellence in Philosophy

College Prize for Excellence in Physics

College Prize for Excellence in Astronomy

Augustus Howe Buck Scholar

## Area of Specialization

Philosophy of Science, Kant, Wittgenstein, Metaphysics, Philosophy of Physics

## Areas of Competence

History of Modern Philosophy, History of Early Analytic Philosophy

## Languages

English (native speaker)

German (conversational with advanced oral comprehension and reading levels)

## Publications

“Bohr on EPR, the Quantum Postulate, Determinism, and Contextuality” In *Foundations of Physics* 54. No. 3, 1-35. (2025)

## Proceedings

“A New Reading of the Second Analogy: The Nomologically-Determined Object View.” In Christoph Horn & Rainer Schäfer, *Kant’s Project of Enlightenment: Proceedings of the 14th International Kant Congress*. Berlin: De Gruyter. (Forthcoming)

## Works In Preparation

Kant on Material Unity, Systematicity, and Progressive Approximation of Nomic Necessity

Nonsense and the Supersensible Reality of Thinking: Re-Reading Wittgenstein’s “Picture Theory” (with Robert Engelman). Under Review at *Wittgenstein-Studien*

## Talks

Freedom and the Supersensible Reality of Thinking in Wittgenstein’s *Tractatus*.

Realismus und Idealismus heute III Kolloquium, Universität Bonn, 04. Mai, 2023

Research Colloquium of Markus Gabriel, University of Bonn, May 22, 2023

Forms of Thought: From Classical German to Early Analytic Philosophy, University of Stuttgart, July 1, 2024

Metaphysics and Freedom Conference presented by Stanford University’s German Philosophy Group, March 14, 2025

An Immanent Critique of Many-Worlds Interpretations of Quantum Mechanics, or: On the Reality of Quantum Jumps. Bonn History and Philosophy of Physics Research Seminar, May 16, 2023

Comments on “Grammar and Method in Wittgenstein’s Philosophical Investigations,” Pacific APA in Portland, OR, March 21, 2024

Non-Living Natural Kinds and the Material Unity of Nature in the Critical Philosophy, Kant and Hegel on Objectivity and Nature Workshop, Stanford University, November 16, 2024

## Teaching Experience

Mathematics Teacher at St. Johnsbury Academy, 2017-2018

Teaching Assistant for PHIL 165: *Quantum Mechanics*, Winter Quarter 2020 at Stanford University

Teaching Assistant for PHIL 165: *Space and Time*, Winter Quarter 2021 at Stanford University

Teaching Assistant for PHIL 150: *Mathematical Logic*, Fall Quarter 2022 at Stanford University

Teaching Assistant for PHIL 165: *Philosophical Issues in Quantum Mechanics*, Winter Quarter 2022 at Stanford University

Teaching Assistant for PHIL 80: *Mind, Matter, Meaning*, Spring Quarter 2022 at Stanford University

Teaching Assistant for *PHIL 165: Philosophical Issues in Quantum Mechanics*, Winter Quarter 2024 at Stanford University

Teaching Assistant for *PHIL 28S: Philosophical Issues in Artificial Intelligence*, Summer Session 2024 at Stanford University

Humanities, STEM, and Writing Tutor at SARC, Summer Session 2024 at Stanford University

Primary Instructor for *PHIL 60S: Introduction to the Philosophy of Science*, Summer Session 2025 at Stanford University

Teaching Assistant for *PHIL 102: Modern Philosophy from Descartes to Kant*, Fall Quarter 2025 at Stanford University

## Graduate Coursework

### *Philosophy of Science*

*Independent Study on the Gauge Principle in Quantum Physics* – Winter 2019, Thomas Ryckman

*Seminar on the Philosophy of Physics: On the Possibility of a Scientific Metaphysics* – Spring 2019, Thomas Ryckman

*Aristotle's Physics Book One* – Fall 2019, Alan Code

*Scientific Philosophy: from Kant to Kuhn and Beyond* – Spring 2020, Michael Friedman

*Mental Action and its Pathologies* – Spring 2020, Antonia Peacocke

*Quantum Field Theory I (audit)* – Fall 2021, Renata Kallosh

*The Aim and Structure of Cosmological Theory* – Winter 2022, James Weatherall

### *Philosophy of Mathematics and Logic*

*Mathematical Logic* – Fall 2018, Ray Briggs

*Seminar on Philosophy of Logic and Mathematics (Conventionalism)* – Fall 2018, Jared Warren

*Applied Group Theory* – Fall 2018, Christine Taylor

*Metalogic* – Winter 2022, Thomas Icard

### *History of Philosophy*

*History of Ethics: Central Questions in Modern Ethical Theory* – Winter 2019, Terence Irwin

*Political Philosophy: the Social Contract Tradition* – Winter 2019, David Hills

*Kant's Third Critique* – Spring 2019, David Hills

*Aristotle's Physics Book One* – Autumn 2019, Alan Code

*Wittgenstein* – Autumn 2019, David Hills

*Kant's First Critique* – Winter 2020, Michael Friedman

*Scientific Philosophy: from Kant to Kuhn and Beyond* – Spring 2020, Michael Friedman

*Plato's Later Metaphysics and Epistemology* – Winter 2021, Alan Code

*Kant's Foundations of Morality: the Second Critique* – Winter 2021, Michael Friedman

*Wittgenstein* (audit) – Winter 2022, David Hills

### *Value Theory*

*History of Ethics: Central Questions in Modern Ethical Theory* – Winter 2019, Terence Irwin

*Political Philosophy: the Social Contract Tradition* – Winter 2019, David Hills

*Kant's Third Critique* – Spring 2019, David Hills

*Truth* – Winter 2020, David Hills

*Metaphor* – Spring 2020, David Hills

*Kant's Foundations of Morality: the Second Critique* – Winter 2021, Michael Friedman

## Other Professional Activity

Co-President, Graduate Study Body, AY 2019-2020

Faculty-Student Representative, AY 2020-2021

Professional Development Officer, AY 2022-2023

Co-organizer of Kant Retreat for Stanford Graduate Students and Postdoctoral Scholars, Summer 2022

Co-organizer of Kant Retreat for Stanford Graduate Students and Postdoctoral Scholars, Winter 2024

Co-organizer of Kant and Hegel on Objectivity and Nature Workshop, Stanford University, November 2024

Organizer of Stanford Philosophy Department's Weekly Graduate Student Workshop, Spring 2025

Last updated: September 30, 2025

<http://jblevins.org/projects/cv-template/>