

# Patrick Lutz

2846 East Hall  
530 Church St, Ann Arbor, MI 48109  
[pglutz@umich.edu](mailto:pglutz@umich.edu)

## INTERESTS

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Mathematical logic, especially computability theory and descriptive set theory.

## EMPLOYMENT

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<b>University of Michigan</b> Assistant Professor	2025 – present
<b>University of California, Berkeley</b> NSF Postdoc	2024 – 2025
<b>University of California, Los Angeles</b> Hedrick Assistant Adjunct Professor and NSF Postdoc	2021 – 2023

## EDUCATION

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<b>University of California, Berkeley</b> PhD in Mathematics Advisor: Theodore Slaman	2016 – 2021
<b>University of California, Berkeley</b> BA in Mathematics	2012 – 2016

## AWARDS AND FELLOWSHIPS

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<b>Frontiers of Science Award</b> Awarded annually at the International Congress of Basic Science (held at the Beijing Institute of Mathematical Sciences and Applications) to papers in mathematics, physics and computer science	2025
<b>Sacks Prize</b> Awarded annually by the ASL for the most outstanding doctoral dissertation in mathematical logic	2022
<b>NSF Mathematical Sciences Postdoctoral Fellowship</b>	2022
<b>Outstanding Graduate Student Instructor Award</b> Awarded for outstanding work in teaching on the Berkeley campus	2018 (Math), 2022 (EECS)

## PAPERS

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### Published/Accepted

<b>Incompleteness and Jump Hierarchies</b> with James Walsh <i>Proceedings of the American Mathematical Society</i>	2020
<b>Formalizing Galois Theory</b> with Thomas Browning <i>Experimental Mathematics</i>	2021
<b>Conway and Doyle Can Divide by Three, But I Can't</b> <i>The Mathematical Intelligencer</i>	2024
<b>Martin's Conjecture for Regressive Functions on the Hyperarithmetical Degrees</b> <i>Journal of Mathematical Logic</i>	2024
<b>Part 1 of Martin's Conjecture for Order-Preserving and Measure-Preserving Functions</b> with Benjamin Siskind <i>Journal of the American Mathematical Society</i>	2025
<b>Coding Information into All Infinite Subsets of a Dense Set</b> with Matthew Harrison-Trainer and Lu Liu To appear in <i>Israel Journal of Mathematics</i>	

## Submitted

- The Solecki Dichotomy and the Posner-Robinson Theorem Are Almost Equivalent** 2023  
Submitted to *Bulletin of Symbolic Logic*
- A Theory Satisfying a Strong Version of Tennenbaum's Theorem** with James Walsh 2023  
Submitted to *Journal of Mathematical Logic*
- Bounding the dimension of exceptional sets for orthogonal projections** 2025  
with Peter Cholak, Marianna Csörnyei, Neil Lutz, Elvira Mayordomo and D.M. Stull  
Submitted to *Proceedings of the American Mathematical Society*
- Ranking theories via encoded  $\beta$ -models** with Hanul Jeon, Fedor Pakhomov, and James Walsh 2025  
Submitted to *Journal of Symbolic Logic*
- Borel Graphable Equivalence Relations** with Tyler Arant and Alexander S. Kechris 2025  
Submitted to *Advances in Mathematics*

## Preprints

- A Note on a Conjecture of Sacks** with Kojiro Higuchi

## In Preparation

- Local Martin's Conjecture, Revisited** with Vittorio Bard
- Hausdorff Dimension and Continuous Images** with Joseph S. Miller
- Complexity of Oracles for Packing Dimension**
- Measure Hyperfiniteness and Lossless Expansion** with Jan Grebík
- Algorithmic Information Bounds for Distances and Orthogonal Projections**  
with Peter Cholak, Marianna Csörnyei, Neil Lutz, Elvira Mayordomo and D. M. Stull

## INVITED TALKS

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### Plenary talks

- ASL North American Annual Meeting 2025
- Logic Colloquium (ASL European Summer Meeting) 2025

### Upcoming talks

- AMS Midwest Sectional Meeting 2025
- CMU logic seminar 2025
- Notre Dame logic seminar 2025
- Rutgers logic seminar 2025

### Part 1 of Martin's Conjecture

- Second Workshop on Digitalization and Computable Models (WDCM-2020) 2020
- Midwest Computability Seminar 2020
- UCLA-Caltech Logic Seminar 2020
- JMM ASL/AMS special session on Computability Theory and Effective Mathematics 2021
- New England Recursion and Definability Seminar (NERDS 19.0) 2021
- UIC Math Colloquium 2024
- NUS Young Mathematician Lecture Series 2024

### Formalizing Galois Theory

- Lean Together 2021 2021

### Sacks Conjecture and Borel Quasi-Orders

- Southeastern Logic Symposium (SEALS 2021) 2021
- Caltech Logic Seminar 2021

### Hausdorff Dimension and Continuous Images

- AIM Workshop on Effective Methods in Measure and Dimension 2022
- Very Informal Gathering of Logicians 2023

**The Solecki Dichotomy and the Posner-Robinson Theorem**

Michigan Logic Seminar	2022
Online Logic Seminar	2023
Berkeley Logic Colloquium	2023
Caltech Logic Seminar	2023

**Coding Information into Dense Sets**

Southeastern Logic Symposium (SEALS 2023)	2023
ASL North American Annual Meeting	2023
Notre Dame Logic Seminar	2023

**Martin's Conjecture Past the Hyperjump**

Cornell Logic Seminar	2023
IMS Workshop "From omega to Omega"	2023

**A Theory Which *Really* Doesn't Have a Computable Model**

Penn State Logic Seminar	2023
AMS Midwest Spring Sectional Meeting	2024
AMS Western Spring Sectional Meeting	2025

**Measure Hyperfiniteness and Lossless Expansion**

McGill Descriptive Dynamics and Combinatorics Seminar	2024
UIC Logic Seminar	2024
Nankai Logic Colloquium	2025

**Borel graphable equivalence relations**

Caltech Logic Seminar	2024
Computability and Mathematical Definability (70 <sup>th</sup> birthday conference for Theodore Slaman)	2024
Mid-Atlantic Mathematical Logic Seminar (MAMLS)	2024

**Complexity of oracles for packing dimension**

NUS logic seminar	2024
AMS Western Spring Sectional Meeting	2025

**TEACHING**

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**UCLA (as main instructor)**

Algorithms (Math 182)	Fall 2021, Winter 2022
Introduction to Set Theory (Math 114S)	Winter 2022
Graduate Seminar in Logic (Math 285D)	Spring 2022
Mathematical Game Theory (Math 167)	Fall 2023

**UC Berkeley (as main instructor)**

Linear Algebra & Differential Equations (Math 54)	Summer 2017
Discrete Mathematics and Probability Theory (CS 70)	Summer 2021
Introduction to Analysis (Math 104)	Fall 2024
Mathematical Logic (Math 125A)	Spring 2025

**UC Berkeley (as graduate student TA)**

Linear Algebra & Differential Equations (Math 54)	Fall 2016, Spring 2021
Math for Biology Majors (Math 10B)	Spring 2017, Spring 2018
Introduction to Mathematical Logic (Math 125A)	Fall 2018
Incompleteness and Undecidability (Math 136)	Fall 2018

**UC Berkeley (as undergraduate student TA)**

Data Structures (CS 61B)	Summer 2014, Fall 2014, Spring 2015, Fall 2015
Algorithms (CS 170)	Spring 2016

## MENTORSHIP

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### Berkeley directed reading program

Guided undergraduate students doing independent reading projects 2017 - 2021

### Berkeley Connect

Mentor for Berkeley Connect program in mathematics 2019 - 2020

## SERVICE

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### Referee

*Information and Computation, Fundamenta Mathematicae, Journal of Symbolic Logic, Computability in Europe, Logical Methods in Computer Science, Journal of Mathematical Logic, Transactions on Computational Logic*

### Seminars organized/co-organized

Seminar on higher order reverse math at Berkeley	2025
UCLA Logic Colloquium	2022 – 2023
Various learning seminars at UCLA	2021 – 2023
Berkeley Lean Seminar	Summer 2020
Berkeley Student Logic Colloquium	2018 – 2020