

Katalin Berlow — Curriculum Vitae

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Research Interests

My research focuses on applied descriptive set theory, especially descriptive combinatorics, measured group theory, and their applications to ergodic theory and geometric group theory. I work with the broader goal of uncovering how combinatorial structure encodes dynamical and group-theoretic information.

Education

University of California, Berkeley

Ph.D. in Mathematics

Advisors: Andrew Marks, Robin Tucker-Drob

Berkeley, CA

2021–2026 (*expected*)

Carnegie Mellon University

B.S. in Mathematics with Honors

Pittsburgh, PA

2017–2021

Honors and Fellowships

Simons Dissertation Fellowship in Mathematics, 2025.

NSF Graduate Research Fellowship, 2021.

Fulbright Fellowship, 2021 (*declined*)

Benter Foundation Mathematics Scholarship, 2021.

Duluth REU, 2020.

Research Publications

In Preparation.....

[1]: **A Measurable Analog to Euler’s Formula in Pmp Graphs** (in preparation, 2025+).

[2]: **Equivalence Relations Acting on Bundles of Trees** (in preparation, 2025+).

with R. Chen, A. Tserunyan, R. Tucker-Drob

[3]: **Separating Complexity Classes of LCL Problems on Grids, Part 2** *with A. Bernshteyn, C. Lyons, F. Weilacher* (in preparation, 2025+).

Submitted.....

[4]: **The Polychromatic Number of Grids** (Submitted, 2025).

arXiv:2508.18559. *with E. Hou*

[5]: **Separating Complexity Classes of LCL Problems on Grids** (submitted, 2025+).

arXiv:2501.17445. *with A. Bernshteyn, C. Lyons, F. Weilacher*

Published.....

[6]: Intersection Bodies of Polytopes, *Beitr Algebra Geom*, 63 (2022), 419–439.

arXiv:2110.05996. *with M. Brandenburg, C. Meroni, I. Shankar*

[7]: Analysis on Almost Abelian Lie Groups, *J. Math. Sci.* (2022).

arXiv:2004.04369. *with M. Almora-Rios et al.*

[8]: Restricted Stacks as Functions, *Discrete Mathematics*, 334 (2021).

arXiv:2008.01164

Selected Talks

Invited Talks.....

A Measurable Analog to Euler's Formula in Pmp Graphs, North American Descriptive Set Theory, University of Maryland, Oct 2025.

Separating Complexity Classes of LCLs on Grids, CanaDAM, Ottawa, May 2025.

Separating Complexity Classes of LCLs on Grids, South Eastern Logic Symposium, University of Florida, Mar 2025.

Other Research Talks.....

Borel Polychromatic Number of Graphs Induced by \mathbb{Z}^d Actions, Berkeley Student Logic Colloquium, Dec 2023.

Restricted Stacks as Functions, AMS Western Sectional Meeting, Oct 2020.

Almost Abelian Groups, Their Subgroups and Automorphisms, Young Mathematicians Conference, Aug 2019.

Teaching

Main Instructor.....

MATH 110: Abstract Linear Algebra, UC Berkeley, Summer 2025

Teaching Assistant/Graduate Student Instructor.....

MATH 113: Abstract Algebra, UC Berkeley, Fall 2025

MATH 1B: Calculus II, UC Berkeley, Spring 2023

MATH 54: Linear Algebra and Differential Equations, UC Berkeley, Fall 2022

MUSA 74: Transition to Upper-Division Mathematics, UC Berkeley, Fall 2021

21-127: Concepts of Mathematics, Carnegie Mellon, Spring 2020

33-142: Physics II for Engineers, Carnegie Mellon, Summer 2018

Organizing and Outreach

Mentorship.....

Visiting Research Mentor, Duluth REU in Combinatorics, (2021–2024).

Mentor, UC Berkeley Directed Reading Program (2021–2025).

Topics: extremal/probabilistic combinatorics, descriptive set theory, equidecompositions, amenable groups.

Seminars Organized.....

Distributed Algorithms and Borel Combinatorics Seminar, UC Berkeley, Fall 2023

Descriptive Set Theory Seminar, UC Berkeley, Spring 2022

Topics in Mathematics (Virtual), 2021

Professional Service.....

Reviewer, *Discrete Mathematics*

Expository Writing and Miscellaneous

Expository.....

Amenable groups acting on trees (on website), 2024

Riddles (on website), 2023

Miscellaneous.....

Erdős Number: 3

Languages: English (native), Hungarian (learning)