Joshua Hinman

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EDUCATION

University of Washington, Seattle, WA — September 2020–present
Ph.D., Mathematics (expected June 2026)
Thesis advisor: Isabella Novik

Yale University, New Haven, CT — May 2020
B.A., Mathematics

RESEARCH INTERESTS

Convex polytopes, geometric combinatorics.

PUBLICATIONS & PREPRINTS

Fat shellable spheres. Submitted. `arXiv:2509.20771`.

Reconstructing polytopes and pseudomanifolds. Submitted. `arXiv:2505.13789`.

Face Numbers of Shellable CW Balls and Spheres. *Israel J. Math.*, to appear. `arXiv:2409.08427`.

Lower bounds on face numbers of polytopes with m facets. *Electron. J. Combin.* **32** (2025), no. 1, Paper No. 1.28, 11 pp.

A positive answer to Bárány's question on face numbers of polytopes. *Combinatorica* **43** (2023), no. 5, 953–962.

Minimizing closed geodesics on polygons and disks (with Ian Adelstein, Arthur Azvolinsky, and Alexander Schlesinger). *Involve* **14** (2021), no. 1, 11–52.

Rigidity of Ulam sets and sequences (with Borys Kuca, Alexander Schlesinger, and Arseniy Sheydvasser). *Involve* **12** (2019), no. 3, 521–539.

The unreasonable rigidity of Ulam sets and sequences (with Borys Kuca, Alexander Schlesinger, and Arseniy Sheydvasser). *J. Number Theory* **194** (2019), 409–425.

PRESENTATIONS

Combinatorics Seminar, University of Washington, Seattle, WA — February 2025
Invited talk: "Face Numbers of Squishy Polytopes"

AMS Special Session on Topological and Geometric Methods in Combinatorics, — October 2024
AMS Fall Western Sectional Meeting, Riverside, CA
Invited talk: "Face Numbers of Shellable CW Balls and Spheres"

Combinatorics Seminar, University of Washington, Seattle, WA — October 2023
Invited talk: "Face Numbers and Angles of Polytopes"

Minisymposium on Geometric Combinatorics — June 2023
Canadian Discrete and Algorithmic Mathematics Conference (CanaDAM), Winnipeg, MB
Invited talk: "A Positive Answer to Bárány's Question on Face Numbers of Polytopes"

Combinatorics and Geometry of Convex Polyhedra, — March 2023
Simons Center for Geometry and Physics, Stony Brook, NY
Invited talk: "A Positive Answer to Bárány's Question on Face Numbers of Polytopes"

1-2-3 Seminar, University of Washington, Seattle, WA — March 2023
Invited talk: "Solving Math Problems with Pictures"

Undergraduate Knot Theory Conference (UnKnot), University of Washington, Bothell, WA — July 2019
Contributed talk: "Multigraph Chord Diagrams" (with Mrinal Dursun and Logan Rumbaugh)

MAA Student Paper Sessions, MAA MathFest, Chicago, IL — July 2017
Contributed talk: "Ulam Sequences" (with Borys Kuca and Alexander Schlesinger)

Teaching

Pre-Doctoral Instructor, University of Washington
MATH 125 Calculus with Analytic Geometry II   Su 2022

Teaching Assistant, University of Washington
MATH 120 Precalculus   Au 2021, Au 2022, Au 2023, Au 2024, Au 2025
MATH 124 Calculus with Analytic Geometry I   Au 2020, Wi 2022, Wi 2024, Wi 2025
MATH 125 Calculus with Analytic Geometry II   Wi 2021, Sp 2022, Wi 2023
MATH 126 Calculus with Analytic Geometry III   Sp 2021, Sp 2025

Outreach & Volunteering

Math Circle, University of Washington
Head Instructor   Au 2023–Sp 2024, Wi 2025
Instructor   Au 2022–present

Washington Directed Reading Program, University of Washington   Sp 2024
Project Mentor, "Polytopes and Higher Dimensions"

Math Olympiad, University of Washington   June 2018, 2019, 2024, 2025

Family Math Night, Assumption–St. Bridget School, Seattle, WA   March 2025, October 2025

STEM Night, Einstein Middle School, Shorline, WA   May 2025

AweSUMM Math Space, Seattle Universal Math Museum/Kent Library, Kent, WA   February 2024

Guest Teacher, Assumption–St. Bridget School, Seattle, WA   October 2023

Service

Discrete Mathematics   2025
Referee

Electronic Journal of Combinatorics   2025
Referee

Awards

Walter J. Michaelis Grad Fellowship in Mathematics   2025
Department of Mathematics, University of Washington

Graduate Research Fellowship   Sp 2023, Su 2023, Sp 2024, Su 2024, Su 2025
Department of Mathematics, University of Washington

Provost's Fellowship   2020, 2021
Department of Mathematics, University of Washington

Putnam Competition
Top 200   2018
Top 500   2016

Skills

Math/Design Software
SageMath, polymake, Wolfram Mathematica, Inkscape, Blender, GIMP

Programming Languages
Wolfram, MATLAB, Java, Python, C++, C, R

Teaching Software
Canvas, WebAssign, Gradescope