Hannah Friedman

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Department of Mathematics

University of California, Berkeley

EDUCATION

University of California, Berkeley — Expected May 2026

PhD Candidate in Mathematics jointly advised by Bernd Sturmfels and Serkan Hoşten

Harvey Mudd College — May 2023

BS in Mathematics with High Distinction, Honors in Mathematics

Thesis advised by Michael Orrison

AWARDS & HONORS

Chancellor's Fellowship, UC Berkeley — 2023

Alvin White Prize, Harvey Mudd College — 2023

Presented to a student or students who have contributed greatly to the humanistic side of the Harvey Mudd College Mathematics Community.

Giovanni Borrelli Mathematics Fellowship, Harvey Mudd College — 2021 - 2022

Conferred on one or two junior mathematics majors in recognition of the ability to complete high quality research independently or in tandem with a faculty advisor.

Courtney S. Coleman Prize, Harvey Mudd College — 2021

Awarded to three rising juniors who excel in mathematics.

RESEARCH ACTIVITES

- SL Math Summer School: New Perspectives on Discriminants and Applications — MPI MiS, June 2025
- Visit to Max Planck Institute for Mathematics in the Sciences — Leipzig, Summer 2025
- Problem-Solving Workshop: Computational Geometric Analysis — CUNY Graduate Center, May 2025
- Workshop on the Applications of Commutative Algebra — The Fields Institute, May 2025
- Organized Non-Linear Algebra Seminar — UC Berkeley, December 2024
- Workshop for Women in Algebraic Statistics — St John's College, Oxford, July 2024
- Visit to Max Planck Institute for Mathematics in the Sciences — Leipzig, Summer 2024
- Visit to Max Planck Institute for Mathematics in the Sciences — Leipzig, Summer 2023

PUBLICATIONS

- Renato G. Bettiol, Hannah Friedman. Counting Homogeneous Einstein Metrics. Submitted (2025).
- Paul Breiding, Taylor Brysiewicz, Hannah Friedman. Homotopy Iterators. Submitted (2025).
- Hannah Friedman, Bernd Sturmfels, Max Wiesmann. Squared Linear Models. Submitted (2025).
- Hannah Friedman, Serkan Hoşten. Grassmann and Flag Varieties in Linear Algebra, Optimization, and Statistics: An Algebraic Perspective. Submitted (2025).
- Yulia Alexandr, Kristen Dawson, Hannah Friedman, Fatemeh Mohammadi, Pardis Semnani, Teresa Yu. Decomposing Conditional Independence Ideals with Hidden Variables. Submitted (2025).
- Hannah Friedman. Likelihood Geometry of the Squared Grassmannian. *Proceedings of the American Mathematical Society*, **153** (2025) 4463-4474.
- Karel Devriendt, Hannah Friedman, Bernhard Reinke, Bernd Sturmfels. The Two Lives of the Grassmannian. *Acta Universitatis Spientiae, Mathematica*, **17** (2025) 8.
- Hannah Friedman, Bernd Sturmfels, Max Zubkov. Likelihood Geometry of Determinantal Point Processes. *Algebraic Statistics*, **15** (2024) 15-25.
- Hannah Friedman. Long Increasing Subsequences, senior thesis advised by Michael Orrison.
- Hannah Friedman, Amani R. Maina-Kilaas, Julianna Schalkwyk, Hina Ahmed, and Jamie Haddock. An Interpretable Joint Nonnegative Matrix Factorization-Based Point Cloud Distance Measure, *Proceedings of the Conference on Information Sciences and Systems (CISS)*, Baltimore, MD, March 2023.

TALKS

Key: ♣ = invited; ♠ = contributed; ◇ = seminar/lecture.

- Counting Homogeneous Einstein Metrics.
  - ♣ Santa Clara University Mathematics and Computer Science Colloquium, November 11, 2025.
  - ♣ San Francisco State University Algebra, Combinatorics, and Geometry Seminar, October 8, 2025.
  - ◇ UC Berkeley Seminar on Commutative Algebra and Algebraic Geometry, September 30, 2025.
- Grassmann and Flag Varieties in Linear Algebra, Optimization, and Statistics: An Algebraic Perspective.
  - ♣ New Frontiers of Geometry and Combinatorics in Machine Learning at SIAM AG, July 10, 2025.
- Squared Linear Models
  - ◇ MPI MiS Seminar on Nonlinear Algebra, June 19, 2025.
- Solving Polynomial Equations (Software Demsonstration)
  - ♣ Problem Solving Workshop: Computational Geometric Analysis, June 4, 2025.
- Likelihood Geometry of the Squared Grassmannian
  - ♣ Session on Advances in Applied Algebra and Algebraic Statistics at the AWM Resarch Symposium, March 27, 2025.
  - ♠ AlgStat 2025, March 27, 2025.
  - ♣ AMS Special Session on Algebraic Statistics in Our Changing World at JMM, January 8, 2025.
  - ◇ UC Berkeley Combinatorics Seminar, October, 2024.
  - ♠ Workshop for Women in Algebraic Statistics at St. John's College, Oxford, July, 2024.
- Likelihood Geometry of the Squared Grassmannian
  - ◇ University of Wisconsin Applied Algebra Seminar, May 15, 2025.
- Polyhedral Geometry and Gröbner Bases
  - ◇ Tropical geometry reading group at UC Berkeley, February 2025.
- The Squared Grassmannian
  - ♣ University of Washington Combinatorics and Geometry Seminar, January 15, 2025.
- What is algebraic statistics?
  - ♠ Bay Area Discrete Math Day, December 7, 2024.
- Phylogenetics and Tensors
  - ◇ Tensor reading group at UC Berkeley, November, 2024.
- Representation Theory for Spaces of Tensors
  - ◇ Tensor reading group at UC Berkeley, October, 2024.
- Optimization over Two Embeddings of the Grassmannian
  - ♣ Codex seminar, July 2024.
- Likelihood Geometry of Determinantal Point Processes
  - ◇ Algebra-Geometry-Combinatorics Afternoon at SFSU, November 2023.
- Long Increasing Subsequences
  - ♠ Harvey Mudd Thesis Presentation Days.
- A New Basis for k-Local Class Functions
  - ♠ 2023 Joint Math Meetings.

TEACHING & MENTORSHIP

- URep Leader, Fall 2024 - current
- Graduate Student Instructor at UC Berkeley:
  - Math 16B: Analytic Geometry and Calculus, Fall 2025
  - Math 250B: Graduate Commutative Algebra, Spring 2025
  - Math H110: Honors Abstract Linear Algebra, Spring 2025
  - Math 55: Discrete Math, Fall 2024
  - Math 1A: Calculus I, Spring 2024
- UC Berkeley Directed Reading Program Mentor, Spring 2024 & Fall 2025

– President of Women in Math at Harvey Mudd College, Fall 2022-Spring 2023

SKILLS
– Programming Languages: Python, MatLab, Macaulay2, Java, C++, R, Julia
– Languages: English (fluent), German (fluent), Mandarin (proficient), Hebrew (proficient)