

Hannah Friedman

Email: hannahfriedman@berkeley.edu
Website: hannahyfriedman.com

Department of Mathematics
University of California, Berkeley

EDUCATION

University of California, Berkeley

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

Expected May 2026

Harvey Mudd College

BS in Mathematics with High Distinction, Honors in Mathematics

May 2023

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 ACTIVITIES

- Visit to Max Planck Institute for Mathematics in the Sciences Leipzig, Summers 2023-2025
- SL Math Summer School: New Perspectives on Discriminants and Applications MPI MiS, June 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

PUBLICATIONS

- Viktoriia Borovik, Hannah Friedman, Serkan Hoşten, Max Pfeffer. Numerical Algebraic Geometry for Energy Computations on Tensor Train Varieties. Submitted (2025).
- Renato G. Bettoli, 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. *SIAM Journal on Applied Algebra and Geometry* (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. *Advances in Applied Mathematics* **174** (2026) 103003.
- 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 Scientiae Mathematicicae*, **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 Demonstration)
 - ♣ 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 Research 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.
- 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.
- 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

- Unbounded Representation 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)