

Benjamin Baily

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EDUCATION

Ph.D. Mathematics

2022-Present

University of Michigan, Ann Arbor, MI

Thesis title: *Classification of Minimal Singularity Thresholds*

Thesis Advisor: Karen Smith

BA Mathematics

2018-2022

Williams College, Williamstown, MA

Thesis title: *Completions of Countable Excellent Rings in Equal Characteristic Zero*

Thesis advisor: Susan Loepp

AWARDS, GRANTS, AND HONORS

- **Simons Dissertation Fellowship.** July 2025. Awarded by the Simons Foundation.
- **Luther Claborn Mathematics Endowment Award.** April 2025. Awarded by the University of Michigan math department.
- **Honored Instructor.** Fall 2022. Awarded by Michigan Housing to instructors that had a positive impact on a residential student's collegiate journey.
- **The Rosenberg Prize in Mathematics, First Prize.** Joint with Olivia Straw. May 2022. Awarded by the Williams College Math Department to the outstanding senior math majors.
- **The Benedict Prize in Mathematics, First Prize.** Joint with Chenyang Sun. June 2020. Awarded by the Williams College Math Department to the outstanding sophomores in the math department.

PUBLICATIONS, PREPRINTS, AND ARTICLES IN PREPARATION

8. **Homogeneous Ideals with Minimal Singularity Thresholds.** In preparation, 2026.
7. **Extremal F -Thresholds in Regular Local Rings.** ArXiv preprint January 2026.
6. **Strength, Partition Rank, and Algebraic Closure,** with A. Lampert. ArXiv preprint December 2025, submitted.
5. **On lower bounds for the F -pure threshold of equigenerated ideals.** ArXiv preprint June 2025.
4. **On deformation of perfectoid purity in Gorenstein domains,** with K. Dovgodo, A. Simpson, and J. Westbrook. ArXiv preprint May 2025, submitted.
3. **Irreducibility over the Max-Min Semiring,** with J. Dell, H. L. Fleischmann, F. Jackson, S. J. Miller, E. Pesikoff, and L. Reifenberg. Journal of Integer Sequences, 2025.
2. **Completions of Countable Excellent Rings in Equal Characteristic Zero,** with S. Loepp. In *Journal of Algebra and its Applications*, 2024.
1. **The Bergman Game,** with J. Dell, I. Durmić, H. Fleischmann, F. Jackson, I. Mijares, S. J. Miller, E. Pesikoff, L. Reifenberg, A. S. Reina, and Y. Yang. Conference proceedings of the 20th International Conference on Fibonacci Numbers and Their Applications, 2022.

INVITED TALKS

2. "Classification of Minimal Singularity Thresholds" at Commutative Algebra in the South, Georgia State University, April 2025.
1. "A Lower Bound on Graph Geometric Gonality" at the University of Kentucky, Algebra Seminar, April 2023.

TEACHING AND MENTORING

Graduate Student Instructor

University of Michigan

Served as primary instructor for a section of the listed classes.

- **Math 115 (Calculus 1):** Fall 2022, Winter 2023, Fall 2024, Winter 2024, Summer 2024, Fall 2025.

Directed Reading Program Mentor

University of Michigan

Met 1-on-1 weekly with an undergraduate student to cover an extracurricular topic.

- Fall 2022. Topic: chip-firing games on graphs. Source: *Divisors and Sandpiles*, Corry and Perkinson.
- Winter 2024. Topic: chip-firing games on graphs. Source: *Divisors and Sandpiles*, Corry and Perkinson.
- Summer 2024. Topic: ring theory. Source: *Abstract Algebra*, Dummit and Foote.
- Fall 2024. Topic: chip-firing games on graphs. Source: *Divisors and Sandpiles*, Corry and Perkinson.
- Fall 2025. Topic: Bezout's theorem in projective geometry. Source: *Undergraduate Algebraic Geometry*, Reid.