

# Sam Kim Miller

## Curriculum Vitae

Department of Mathematics  
University of Georgia

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Last updated Jan 7, 2026

### Mathematics Employment and Education

- 2025–Present **Limited-Term Assistant Professor**, *University of Georgia*  
Mentors: Nate Harman, Dan Nakano
- 2019–2025 **Ph.D. in Mathematics**, *University of California, Santa Cruz*  
Advisor: Robert Boltje
- 2013–2017 **B.S. in Mathematics**, *Harvey Mudd College*  
Advisors: Arthur Benjamin, Mohamed Omar

### Grants, Honors, and Awards

- 2025–2026 US Junior Oberwolfach Fellow
- 2025 UCSC Department of Mathematics Outstanding Research Award
- 2025–Present Sigma Xi Full Membership
- 2025–2027 AMS-Simons Travel Grant
- 2024–2025 UCSC Chancellor’s Dissertation Full-Year Fellowship
- 2014–2016 Putnam Top 500 Finishers
- 2013 ICTM State Math Contest Individual Winner
- 2013 USCF SuperNationals: 1st Place (U1200 Division)

### Research

#### Interests:

Representation theory, tensor-triangular geometry, permutation modules, finite(ish) groups

#### Papers and Preprints

13. **A semisimple subcategory of Khovanov’s Heisenberg category**  
arXiv:2512.13968
12. **Re-framing the classification of ideals in noncommutative tensor-triangular geometry**, *Joint with Timothy De Deyn*  
arXiv:2510.23767
11. **Permutation twisted cohomology, remixed**  
arXiv:2509.00954
10. **The Euler characteristic of an endotrivial complex**, *Joint with Nadia Mazza*  
arXiv:2508.07404
9. **On functoriality and the tensor product property in noncommutative tensor-triangular geometry**  
arXiv:2505.01899

8. **On endosplit  $p$ -permutation resolutions and Broué's conjecture for  $p$ -solvable groups**  
To appear, Represent. Theory, arXiv:2408.04094
7. **Galois descent of splendid Rickard equivalences between blocks of  $p$ -nilpotent groups**  
Proc. Amer. Math. Soc. 153 (5), 1893-1902 (2025), arXiv:2405.16061
6. **The classification of endotrivial complexes**  
Adv. Math. 478, 110414 (2025), arXiv:2403.04088
5. **Relatively endotrivial complexes**  
J. Pure Appl. Algebra, 229 (2), 107867 (2025), arXiv:2402.08042
4. **Brauer pairs for splendid Rickard equivalences, Joint with Jadyn V. Breland**  
J. Algebra, 691, 694-729 (2026), arXiv:2312.10258
3. **Endotrivial complexes**  
J. Algebra, 650, 173-218 (2024), arXiv:2309.12138
2. **A proof of the optimal leapfrogging conjecture, Joint with Arthur T. Benjamin**  
Involve, 18 (1), 105–122 (2025), arXiv:2110.08319
1. **Challenging knight's tours, Joint with Arthur T. Benjamin**  
Math Horizons, 25 (3), 18-21 (2018)

### Theses

#### Ph.D. **Permutation modules and endotrivial complexes**

Advisor: Robert Boltje

#### B.S. **The polynomial combinatorial Hirsch conjecture**

Advisor: Mohamed Omar

## Talks

### Expository and Outreach

Apr 2024 University of San Francisco Math Colloquium

Oct 2022 Science on Tap hosted by Society of Women Engineers, UC Santa Cruz chapter

### Research

Mar 2026 AMS Southeastern Sectional Special Session

Dec 2025 Spectrums in Representation Theory of Algebras and Related Topics

Nov 2025 UCLA Algebra Seminar

Oct 2025 University of California, Santa Cruz Algebra and Number Theory Seminar

Sep 2025 UGA Algebra Seminar (x2)

Aug 2025 AMS Western Sectional Special Session

Aug 2025 UGA Graduate Student Seminar

May 2025 New Directions in Group Theory and Triangulated Categories

Apr 2025 AMS Spring Northeastern Sectional Special Session

Jan 2025 University of Washington Algebra Seminar

Dec 2024 University of Copenhagen Topology Seminar

- Nov 2024 University of California, Berkeley Representation Theory and Tensor Categories Seminar
- Nov 2024 University of California, Santa Cruz Algebra and Number Theory Seminar
- Oct 2024 AMS Western Sectional Special Session
- Oct 2024 University of California, Santa Cruz Mathematics Graduate Student Seminar
- Oct 2024 AMS Southeastern Sectional Special Session
- Jul 2024 Group Actions, Groups, and Geometry
- Jun 2024 Groups and Algebras in Bicocca for Young Algebraists 2024
- Jun 2024 RPTU Kaiserslautern-Landau Algebra Seminar
- Jun 2024 Groups and their Actions: Algebraic, Geometric, and Combinatorial Aspects
- May 2024 Representation Theory and Related Geometry: Progress and Prospects (Nakano 60)
- May 2024 UCLA Algebra Seminar
- May 2024 University of California, Santa Cruz Algebra and Number Theory Seminar
- May 2024 AMS Western Sectional Special Session
- Jan 2024 University of Arizona Algebra Seminar
- Jan 2024 Joint Mathematics Meetings Contributed Paper Session
- Dec 2023 University of Bilkent Algebra Seminar
- Nov 2023 University of Georgia Algebra Seminar
- Oct 2023 University of California, Santa Cruz Mathematics Graduate Student Seminar
- Sep 2023 Algebra and Number Theory in Conversation at Manchester
- May 2023 AMS Western Sectional Special Session
- Jan 2023 Joint Mathematics Meetings Contributed Paper Session
- Nov 2022 University of California, Santa Cruz Mathematics Graduate Student Seminar
- May 2022 University of California, Santa Cruz Postdoc Symposium
- May 2022 University of California, Santa Cruz Mathematics Graduate Student Seminar
- Apr 2022 University of California, Santa Cruz Graduate Student Symposium
- Feb 2021 University of California, Santa Cruz Mathematics Graduate Student Seminar
- Aug 2018 MAA MathFest Contributed Session
- May 2017 Harvey Mudd Senior Thesis Day
- Apr 2017 MAA SoCal/NV Sectional Poster Session

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## Teaching

### At UGA

- Spring 2027 Modular Representation Theory of Finite Groups
- Fall 2026 Calculus (x2)
- Spring 2026 Precalculus (x2)
- Fall 2025 Precalculus (x2)

### At UC Santa Cruz: Instructor of Record

Spring 2024 Combinatorics  
Winter 2024 Introduction to Number Theory  
Fall 2023 Problem Solving Strategies  
Summer 2023 Cryptography  
Summer 2022 Introduction to Number Theory  
Summer 2021 Introduction to Proof and Problem Solving  
Spring 2021 Introduction to Partial Differential Equations

[At UC Santa Cruz: Teaching Assistant](#)

Spring 2023 Linear Algebra  
Winter 2023 Programming for Mathematics  
Fall 2022 Advanced Linear Algebra  
Spring 2022 Industrial Mathematics  
Winter 2022 Programming for Mathematics  
Fall 2021 Vector Calculus  
Winter 2021 Linear Algebra  
Fall 2020 Linear Algebra  
Summer 2020 Introduction to Calculus of Several Variables  
Spring 2020 Numerical Analysis  
Winter 2020 Calculus for Science, Engineering, and Mathematics II  
Fall 2019 Calculus for Science, Engineering, and Mathematics I

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## Organization and Service

### Organization

2025–Present **UGA Algebra Seminar**  
Organizer

2022–2024 **University of California, Santa Cruz Mathematics Graduate Student Seminar**  
Organizer

2022 **University of California, Santa Cruz Graduate Student Committee**  
Electoral Board Member

2021 **University of California, Santa Cruz Mathematics Department Social Committee**  
Organizer

### Organized Reading Seminars

2025 Introduction to Soergel Bimodules  
2025 Introduction to Tensor Categories  
2024 Blocks of Cyclic Defect  
2021 Local Class Field Theory  
2020 Category Theory

### Mentorship

- 2021–2025 University of California, Santa Cruz Peer Mentorship Program  
2021, 2024 University of California, Santa Cruz Directed Reading Program

#### Refereeing and Reviewing

Communications in Algebra  
Transactions of the American Mathematical Society  
MathReviews reviewer

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### Other Employment

- 2017–2019 **SupplyFrame, Platform Engineer**  
Software engineer, worked with big data, natural language processing, and machine learning
- 2014–2017 **Harvey Mudd College, Grutor**  
Graded and tutored for various undergraduate courses in mathematics and computer science
- 2014–2015 **YMCA Camp Widjiwagan**  
Led intense week-long canoeing trips for middle- and high-school aged children in the Boundary Waters Canoe Area Wilderness of Minnesota; emphasizing personal growth, self-confidence, and respect for self, nature, others, and equipment