

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 Southwestern 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

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

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

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