

Sam Kim Miller

Curriculum Vitae

Department of Mathematics
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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

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