Sam K Miller | Curriculum Vitae

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Research Interests

- Non/commutative tensor-triangular geometry;
- Modular representation theory of finite groups;
- Invertible objects and Picard groups;
- Intersections of modular representation theory and tensor-triangulated geometry;
- Permutation modules;
- Categorification, diagrammatics, pre-Tannkian categories.

Employment and Education

University of Georgia   **Athens, GA**
Limited Term Assistant Professor (*Postdoc*)   *2025–Present*
Mentors: Nate Harman, Dan Nakano

University of California Santa Cruz   **Santa Cruz, CA**
Doctorate of Philosophy in Mathematics   *2019–2025*
Advisor: Robert Boltje

Harvey Mudd College   **Claremont, CA**
Bachelor Degree in Mathematics, Concentration in Political Science   *2013–2017*
Advisor: Arthur T. Benjamin

Research

In Preparation

Integral endotrivial complexes
w/ Juan Omar Gomez

The noncommutative tensor-triangular geometry of a group algebra
w/ Kent Vashaw

Publications and Preprints

A semisimple subcategory of Khovanov's Heisenberg category
Submitted
arXiv:2512.13968

Re-framing the classification of ideals in noncommutative tensor-triangular geometry
w/ Timothy De Deyn. Submitted
arXiv:2510.23767

Permutation twisted cohomology, remixed
Not yet submitted
arXiv:2509.00954

The Euler characteristic of an endotrivial complex
w/ Nadia Mazza. Submitted
arXiv:2508.07404

On functoriality and the tensor product property in noncommutative tensor-triangular geometry
Submitted
arXiv:2505.01899

On endosplit p-permutation resolutions and Broué's conjecture for p-solvable groups
Submitted
arXiv:2408.04094

Galois descent of splendid Rickard equivalences between blocks of p-nilpotent groups
Proc. Amer. Math. Soc. 153 (5), 1893-1902 (2025)
arXiv:2405.16061
The classification of endotrivial complexes
Adv. Math. 478, (2025)
arXiv:2403.04088
Relative endotrivial complexes
J. Pure Appl. Algebra, 229 (2), (2025)
arXiv:2402.08042
Brauer pairs for splendid Rickard equivalences
w/ J. Breland. J. Algebra, 691, 694-729 (2026)
arXiv:2312.10258
Endotrivial complexes
J. Algebra, 650, 173-218 (2024)
arXiv:2309.12138
A proof of the optimal leapfrogging conjecture
w/ A. T. Benjamin. Involve, 18 (1), 105–122 (2025)
arXiv:2110.08319
Challenging knight's tours
w/ A. T. Benjamin. Math Horizons, 25 (3), 18-21 (2018)

Theses

Permutation modules and endotrivial complexes	**Advisor: Robert Boltje**
Ph.D. dissertation, 2025	
Combinatorial polynomial Hirsch conjecture	**Advisor: Mohamed Omar**
Undergraduate senior thesis, 2017	

Fellowships, Grants, and Awards

Sigma Xi Full Member	*2025-*
AMS-Simons Travel Grant	*2025-2027*
UCSC Dissertation Year Fellowship	*2024-2025*
Harvey Mudd College Dean's List	*2014-2017*
Putnam: Top 500 Scorers	*2014,2015*
ICTM State Math Contest: 1st Place Individual (Senior Division)	*2013*
USCF SuperNationals: 1st Place (U1200 Division)	*2013*

Talks

Invited Talks

AMS Southeastern Sectional Special Session	*March 2026*
UCLA Algebra Seminar	*November 2025*
UCSC Algebra and Number Theory Seminar	*October 2025*
UGA Algebra Seminar	*August/September 2025*
AMS Western Sectional Special Session	*August 2025*
UGA Graduate Student Seminar	*August 2025*
New Directions in Group Theory and Triangulated Categories Seminar	*May 2025*
AMS Eastern Sectional Special Session	*April 2025*
University of Washington Algebra Seminar	*January 2025*
University of Copenhagen Algebra and Topology Seminar	*December 2024*
UC Berkeley Representation Theory and Tensor Categories Seminar	*November 2024*

AMS Western Sectional Special Session	*October 2024*
UCSC Algebra and Number Theory Seminar	*October 2024*
UCSC Mathematics Graduate Student Colloquium	*October 2024*
AMS Southeast Sectional Special Session	*October 2024*
RPTU Kaiserslautern-Landau Algebra Seminar	*June 2024*
UCLA Algebra Seminar	*May 2024*
UCSC Algebra and Number Theory Seminar	*May 2024*
AMS Western Sectional Special Session	*May 2024*
University of San Francisco Math Colloquium	*April 2024*
University of Arizona Algebra Seminar	*January 2024*
University of Bilkent Algebra Seminar	*November 2023*
University of Georgia Algebra Seminar	*November 2023*
UCSC Mathematics Graduate Student Colloquium	*October 2023*
AMS Western Sectional, Special Session	*May 2023*
UCSC Mathematics Graduate Student Colloquium	*November 2022*
Society of Women Engineers, UCSC Chapter: Science on Tap	*October 2022*
UCSC Mathematics Graduate Student Colloquium	*May 2022*
UCSC Mathematics Graduate Student Colloquium	*February 2021*
Harvey Mudd Senior Thesis Day	*May 2017*

Contributed Talks

Spectrums in Representation Theory of Algebras and Related Topics	*December 2025*
Group Actions, Groups, and Geometry	*July 2024*
Groups and Algebras in Bicocca for Young Algebraists	*June 2024*
Representation Theory and Related Geometry	*May 2024*
JMM 2024 Contributed Paper Session	*January 2024*
DKO Workshop: Algebra and Number Theory in Conversation	*September 2023*
Topics in Representation Theory: Biset Functors	*June 2023*
JMM 2023 Contributed Paper Session	*January 2023*
UCSC Postdoc Symposium Poster Session	*May 2022*
UCSC Graduate Symposium	*April 2022*
MAA MathFest Contributed Paper Session	*August 2018*
MAA SoCal/NV Sectional, Poster Session	*April 2017*

Teaching

At UGA

Graduate seminar: Modular representation theory of finite groups	*Spring 2027*
Math 2250: Calculus (2 sections)	*Fall 2026*
Math 1113: Precalculus (2 sections)	*Spring 2026*
Math 1113: Precalculus (2 sections)	*Fall 2025*

At UCSC: Instructor of Record

Math 116: Combinatorics	*Spring 2024*
Math 110: Introduction to Number Theory	*Winter 2024*
Math 101: Problem Solving Strategies	*Fall 2023*

Math 134: Cryptography	*Summer 2023*
Math 110: Introduction to Number Theory	*Summer 2022*
Math 100: Introduction to Proof and Problem Solving	*Summer 2021*
Math 107: Introduction to Partial Differential Equations	*Spring 2021*

At UCSC: Teaching Assistant

Math 21: Linear Algebra	*Spring 2023*
Math 152: Programming for Mathematics	*Winter 2023*
Math 117: Advanced Linear Algebra	*Fall 2022*
Math 140: Industrial Mathematics	*Spring 2022*
Math 152: Programming for Mathematics	*Winter 2022*
Math 23A: Vector Calculus	*Fall 2021*
Math 21: Linear Algebra	*Winter 2021*
Math 21: Linear Algebra	*Fall 2020*
Math 22: Introduction to Calculus of Several Variables	*Summer 2020*
Math 148: Numerical Analysis	*Spring 2020*
Math 19B: Calculus for Science, Engineering, and Mathematics II	*Winter 2020*
Math 19A: Calculus for Science, Engineering, and Mathematics I	*Fall 2019*

Other Work Experience

SupplyFrame	**Pasadena, CA**
Platform Engineer	*2017-2019*

Software engineer, projects involved big data, natural language processing, and AI.

Harvey Mudd College	**Claremont, CA**
Grutor	*2014-2017*

Graded and tutored undergraduate courses in mathematics and computer science.

Camp Widjiwagan	**Ely, MN**
Trail Staff	*2014-2015*

Led week-long canoeing trips for middle- and high-school aged kids in the BWCA.

Organization and Activities

Organization

UGA Algebra Seminar: Organizer	*2025-*
UCSC Mathematics Graduate Student Colloquium: Organizer	*2022-2024*
UCSC Graduate Student Committee: Electoral Board	*2022*
UCSC Mathematics Department Social Committee: Organizer	*2021-2022*

Reading Groups

Organizer: Blocks of Cyclic Defect (BloCD)	*January 2024*
Organizer: Etingof, Gelaki, Nikshych, Ostrik, Tensor Categories	*January 2025 - Present*
Aschbacher, Kessar, & Oliver, Fusion Systems in Algebra & Topology	*September 2021-March 2022*
Bouc, Biset Functors for Finite Groups	*September 2021-May 2022*
Linckelmann, The Block Theory of Finite Group Algebras	*June 2021-December 2021*
Organizer: Guillot, A Gentle Course in Local Class Field Theory	*January 2021-August 2021*
Organizer: Riehl, Category Theory in Context	*June 2020-September 2020*

Mentorship

UCSC Directed Reading Program: Mentor	*2021, 2024*