Sam K Miller | Curriculum Vitae

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Research Interests

- Commutative and noncommutative tensor-triangular geometry
- Modular representation theory of finite groups.
- Invertible objects and Picard groups of monoidal categories.
- Intersections of modular representation theory and tensor-triangulated geometry.
- Permutation modules.
- Biset functors and applications.
- Galois descent of representations.

Employment and Education

University of Georgia   **Athens, GA**
Limited Term Assistant Professor (*Postdoc*)   *2025–2028*
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

Twisted cohomology for permutation modules   **Mentored by P. Balmer, M. Gallauer**

The Euler characteristic of an endotrivial complex   **w/ N. Mazza**

Publications and Preprints

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

On endosplit p-permutation resolutions and Broue'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**
Submitted, 2024

Endotrivial complexes
J. Algebra, 650, 173-218 (2024)
A proof of the optimal leapfrogging conjecture   w/ A. T. Benjamin
Involve, 18 (1), 105–122 (2025)
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   **Thesis Advisor: Mohamed Omar**
Undergraduate senior thesis, 2017

Fellowships and Awards

Sigma Xi Full Member
Nominated for full Sigma Xi membership   2025

AMS-Simons Travel Grant
Awarded an AMS-Simons early-career travel grant   2025-2027

UCSC Dissertation Year Fellowship
Awarded one of two merit-based full-year fellowships in Physical/Biological Sciences division   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

AMS Western Sectional Special Session	*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*
Group Actions, Groups, and Geometry	*July 2024*
Groups and Algebras in Bicocca for Young Algebraists	*June 2024*
RPTU Kaiserslautern-Landau Algebra Seminar	*June 2024*
Representation Theory and Related Geometry	*May 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*
JMM 2024 Contributed Paper Session	*January 2024*
University of Bilkent Algebra Seminar	*November 2023*
University of Georgia Algebra Seminar	*November 2023*
UCSC Mathematics Graduate Student Colloquium	*October 2023*
DKO Workshop: Algebra and Number Theory in Conversation	*September 2023*
Topics in Representation Theory: Biset Functors	*June 2023*
AMS Western Sectional, Special Session	*May 2023*
JMM 2023 Contributed Paper Session	*January 2023*
UCSC Mathematics Graduate Student Colloquium	*November 2022*
Society of Women Engineers, UCSC Chapter: Science on Tap	*October 2022*
UCSC Postdoc Symposium Poster Session	*May 2022*
UCSC Mathematics Graduate Student Colloquium	*May 2022*
UCSC Graduate Symposium	*April 2022*
UCSC Mathematics Graduate Student Colloquium	*February 2021*
MAA MathFest Contributed Paper Session	*August 2018*
Harvey Mudd Senior Thesis Day	*May 2017*
MAA SoCal/NV Sectional, Poster Session	*April 2017*

Teaching

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*

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*

Work Experience

University of California Santa Cruz   **Santa Cruz, CA**
Graduate Student Instructor   *2021-2025*
Instructor of record for undergraduate courses.

University of California Santa Cruz   **Santa Cruz, CA**
Teaching Assistant   *2019-2025*
Teaching assistant for undergraduate courses.

SupplyFrame   **Pasadena, CA**
Platform Engineer   *2017-2019*
Software engineer, worked primarily with big data and neural networks.

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 outdoor canoeing trips for middle- and high-school aged kids.

Organization and Activities

Organization

UCSC Mathematics Graduate Student Colloquium: Organizer | *September 2022-September 2024*
UCSC Graduate Student Committee: Electoral Board | *March 2022-December 2022*
UCSC Mathematics Department Social Committee: Organizer | *September 2021-May 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 | *September 2024-Present*
UCSC Peer Mentorship Program: Mentor | *September 2023-Present*
UCSC Peer Mentorship Program: Mentor | *September 2021-May 2022*
UCSC Directed Reading Program: Mentor | *September 2021-December 2021*