

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 <i>Limited Term Assistant Professor (Postdoc)</i> Mentors: Nate Harman, Dan Nakano	Athens, GA 2025–2028
University of California Santa Cruz <i>Doctorate of Philosophy in Mathematics</i> Advisor: Robert Boltje	Santa Cruz, CA 2019–2025
Harvey Mudd College <i>Bachelor Degree in Mathematics, Concentration in Political Science</i> Advisor: Arthur T. Benjamin	Claremont, CA 2013–2017

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 noncommutative tensor-triangular geometry <i>Submitted</i> arXiv:2505.01899	
On endosplit p-permutation resolutions and Broué's conjecture for p-solvable groups <i>Submitted</i> arXiv:2408.04094	
Galois descent of splendid Rickard equivalences between blocks of p-nilpotent groups <i>Proc. Amer. Math. Soc. 153 (5), 1893–1902 (2025)</i> arXiv:2405.16061	
The classification of endotrivial complexes <i>To appear, Adv. Math.</i> arXiv:2403.04088	
Relative endotrivial complexes <i>J. Pure Appl. Algebra, 229 (2), (2025).</i> arXiv:2402.08042	
Brauer pairs for splendid Rickard equivalences <i>Submitted, 2024</i>	w/ J. Breland

arXiv:2312.10258

Endotrivial complexes

J. Algebra, 650, 173–218 (2024).

arXiv:2309.12138

A proof of the optimal leapfrogging conjecture

Involve, 18 (1), 105–122 (2025).

arXiv:2110.08319

Challenging knight's tours

Math Horizons, 25 (3), 18–21 (2018).

w/ A. T. Benjamin

w/ A. T. Benjamin

Theses

Permutation modules and endotrivial complexes

Ph.D. dissertation, 2025

Advisor: Robert Boltje

Combinatorial polynomial Hirsch conjecture

Undergraduate senior thesis, 2017

Thesis Advisor: Mohamed Omar

Fellowships and Awards

UCSC Dissertation Year Fellowship

(Around 10 full-length fellowships are awarded each year, 2 per 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 <i>Teaching Assistant</i> Teaching assistant for undergraduate courses.	Santa Cruz, CA 2019-2025
SupplyFrame <i>Platform Engineer</i> Software engineer, worked primarily with big data and neural networks.	Pasadena, CA 2017-2019
Harvey Mudd College <i>Grutor</i> Graded and tutored undergraduate courses in mathematics and computer science.	Claremont, CA 2014-2017
Camp Widjiwagan <i>Trail Staff</i> Led week-long outdoor canoeing trips for middle- and high-school aged kids.	Ely, MN 2014-2015

Organization and Activities

Organization

UCSC Mathematics Graduate Student Colloquium: Organizer	<i>September 2022-September 2024</i>
UCSC Graduate Student Committee: Electoral Board	<i>March 2022-December 2022</i>
UCSC Mathematics Department Social Committee: Organizer	<i>September 2021-May 2022</i>

Reading Groups

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

Mentorship

UCSC Directed Reading Program: Mentor	<i>September 2024-Present</i>
UCSC Peer Mentorship Program: Mentor	<i>September 2023-Present</i>
UCSC Peer Mentorship Program: Mentor	<i>September 2021-May 2022</i>
UCSC Directed Reading Program: Mentor	<i>September 2021-December 2021</i>