Qing Zhang

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POSITIONS

Visiting Assistant Professor   July 2023 – Present
UC Santa Barbara
Mentor: Zhenghan Wang

Golomb Visiting Assistant Professor   Aug 2020 – May 2023
Purdue University
Mentor: Xingshan Cui

Postdoctoral Fellow   Jan 2020 – May 2020
MSRI Program on Quantum Symmetries
Mentor: Richard Ng

EDUCATION

Ph.D. in Mathematics   Aug 2014 – Dec 2019
Texas A&M University
Advisor: Eric Rowell
Thesis: Super-modular Categories

M.Sc. in Mathematics   Sept 2011 – Jan 2014
Beihang University, China

B.Sc. in Mathematics   Sept 2007 – Jul 2011
Hefei University, China

RESEARCH INTERESTS

Tensor categories, topological quantum computation, braid group representation, low-dimensional topology.

PUBLICATIONS AND PREPRINTS

1. (with L. Chang, Q. Kolt and Z. Wang), Modular data of non-semisimple modular categories, arXiv: 2404.09314.

2. (with E. Rowell, H. Solomon), On near-group centers and super-modular categories, *to appear in Contemporary Mathematics*.

3. (with C. Delaney, C. Galindo, J. Plavnik and E. Rowell), *G*-crossed braided zesting, *Journal of the London Mathematical Society*, 2024, 109(1): e12816.

4. (with J. Plavnik, A. Schopieray and Z. Yu), Modular tensor categories, subcategories, and Galois orbits, *Transformation Groups* (2023): 1-26.

5. (with S.-H. Ng, E. Rowell and Y. Wang), Higher central charges and Witt groups, *Advances in Mathematics* 404 (2022): 108388.

6. (with S.-H. Ng and Y. Wang), Modular categories with transitive Galois actions, *Communications in Mathematical Physics* 390.3 (2022): 1271-1310.

7. (with C. Delaney, C. Galindo, J. Plavnik and E. Rowell), Braided zesting and its applications, *Communications in Mathematical Physics* 386.1 (2021): 1-55.

8. (with X. Cui, P. Gustafson and Y. Qiu), From torus bundles to particle-hole equivariantization, *Letters in Mathematical Physics* 112.1 (2022): 1-19.

9. (with P. Bonderson, E. Rowell and Z. Wang), Congruence subgroups and super-modular categories, *Pacific Journal of Mathematics* 296, no. 2 (2018): 257-270.

10. (with P. Bruillard, J. Plavnik and E. Rowell), On classification of super-modular categories of rank 8, *Journal of Algebra and Its Applications* 20, no. 01 (2021): 2140017.

11. (with P. Gustafson, A. Kimball and E. Rowell), Braid group representations from twisted tensor products of group algebras, *Peking Mathematical Journal*, 3, 103-130.

12. (with A. Deaton, P. Gustafson, L. Mavrakis, E. Rowell, S. Poltoratski, S. Timmerman, B. Warren), Integral metaplectic modular categories, *Journal of Knot Theory and Its Ramifications 29*, no. 05 (2020): 2050032.

TEACHING EXPERIENCE	***Transition to Higher Mathematics*** Mathematics Department, UC Santa Barbara	Sep 2024 – Dec 2024
	Vector Calculus 1 Mathematics Department, UC Santa Barbara	Sep 2024 – Dec 2024
	Differential Equations Mathematics Department, UC Santa Barbara	Apr 2024 – June 2024
	Differential Equations Mathematics Department, UC Santa Barbara	Jan 2024 – Mar 2024
	Transition to Higher Mathematics Mathematics Department, UC Santa Barbara	Jan 2024 – April 2024
	Vector Calculus 1 Mathematics Department, UC Santa Barbara	Sep 2023 – Dec 2023
	Ordinary Differential Equations Mathematics Department, Purdue University	Jan 2023 – May 2023
	Ordinary and Partial Differential Equations Mathematics Department, Purdue University	Aug 2022 – Dec 2022
	Linear Algebra Mathematics Department, Purdue University	Jan 2022 – May 2022
	Ordinary Differential Equations Mathematics Department, Purdue University	Aug 2020 – Dec 2021
	Teaching Assistant The Mathematics of Topological Quantum Computing, Research School on Quantum Symmetries, Universidad de los Andes, Bogotá	June 2019 – July 2019
	Teaching Assistant REU on Mathematics of Topological Quantum Computation Mathematics Department, Texas A&M University	June 2018 – July 2018
	Mathematical Concepts – Calculus Mathematics Department, Texas A&M University	Jan 2018 – May 2018
	Teaching Assistant Mathematics Department, Texas A&M University	Aug 2014 – Dec 2019
AWARDS	**Outstanding TA Award** Mathematics Department, Texas A&M University	Spring 2017
	Lechner Graduate Grant Mathematics Department, Texas A&M University	2014 – 2015
	National Scholarship Department of Mathematics, Hefei University	Fall 2009

CONFERENCE TALKS

Quantum groups, tensor categories and quantum field theory, workshop at University of Oslo.   Jan 2025

AMS Special Session on Tensor Categories and Noncommutative Algebras at the Spring Western Sectional Meeting.   May 2024

AMS Special Session on Modular Tensor Categories and TQFTs beyond the Finite and Semisimple at the 2024 Joint Mathematics Meetings in San Francisco. Jan 2024

Conference on C*-Algebras and Tensor Categories, Fields Institution.
Mini-course speaker.   Nov 2023

Quantum invariants and low-dimensional topology, American Institute of Mathematics.   Aug 2023

Scientific session on Hopf Algebras and Related Topics at the 2023 CMS summer meeting.   June 2023

Quantum Symmetries at the CRM, Université de Montréal.   Oct 2022

AMS Special Session on Quantum Algebra and Quantum Topology at the Spring Central Sectional Meeting.   Mar 2022

AMS Special Session on Fusion Categories and Their Applications in Physics at the 2022 Joint Mathematics Meetings.   April 2022

AMS Special Session on Tensor Categories and Applications at the Fall Western Sectional Meeting.   Oct 2021

SIAM Conference on Applied Algebraic Geometry.   Aug 2021

AMS Special Session on Hopf Algebras, Tensor Categories, and Related Homological Methods at the Spring Eastern Sectional Meeting.   Mar 2021

AMS Special Session on Hopf Algebras and Tensor Categories at the 2021 Joint Mathematics Meetings.   Jan 2022

AWM Research Symposium Special Session on Homological Methods in Noncommutative Algebra and Representation Theory.   Apr 2019

AMS Special Session on Quantum Symmetries: Subfactors and Fusion Categories (a Mathematics Research Communities Special Session) at the 2019 Joint Mathematics Meetings in Baltimore.   Jan 2019

AMS Special Session on Tensor Categories and Diagrammatic Methods at the AMS Sectional Meeting in Nashville.   Apr 2018

Special Session on Mathematics of Quantum Phases of Matter and Quantum Information at Math Congress of the Americas. Centre Mont-Royal and McGill University, Montreal, Canada.   July 2017

AMS Special Session on Fusion Categories and Quantum Symmetries at the 2017 Joint Mathematics Meetings in Atlanta.   Jan 2017

SEMINAR TALKS	**Modular Data of Nonsemisimple Modular Categories**, Quantum Symmetries Reunion, Simons Laufer Mathematical Sciences Institute. Aug 2024
	Super-modular Categories from Near-group Centers, Claremont Topology Seminar, Claremont McKenna College. Mar 2024
	The Algebra of Topological Quantum Computing, Purdue AWM Symposium, Purdue University. Apr 2023
	From Congruence Representations to Super-modular Categories, Quantum Topology Seminar. Indiana University Bloomington. Feb 2023
	Braided Zesting and its applications, The TACO Seminar, Loyola University Chicago Nov 2022
	Classification of Modular Categories by Galois Orbit Count, Algebra & Combinatorics Seminar, North Carolina State University Nov 2022
	Classifying Modular Categories, Quantum Symmetry at the CRM, Montreal, Canada Oct 2022
	From torus bundles to particle-hole equivariantization, Quantum Topology Seminar. Indiana University Bloomington. Dec 2021
	Modular categories with transitive Galois actions, Quantum Symmetries Student Seminar. The Ohio State University. Aug 2021
	Modular Categories with Transitive Galois Actions, Online Seminar. Mathematical Sciences Research Institute. May 2020
	Algebraic Questions from Topological Quantum Computation, Quantum Algebra/Quantum Topology Seminar. Ohio State University. Dec 2019
	Algebraic Questions from Topological Quantum Computation, Algebra Seminar. Indiana University Bloomington. Nov 2019
	The Algebra of Topological Quantum Computing, Mathematical Physics Seminar. Purdue University. Nov 2019
	Topological Quantum Computing and Braid Group Representations, Graduate Student Seminar. Texas A&M University. Mar 2019
	Classification of Super-modular Categories, Algebra and Combinatorics Seminar. Texas A&M University. Feb 2019
WORKSHOP PARTICIPATION	Quantum Topology, Quantum Information, and Connections to Mathematical Physics, Texas A&M University, May 27 - 31, 2024
	Workshop on Skew Braces, Braids and the Yang-Baxter Equation at BIRS in Banff, Canada, May 5-10, 2024
	Conference on C*-Algebras and Tensor Categories, Fields Institution, Nov. 6 - 10, 2023

Quantum invariants and low-dimensional topology, American Institute of Mathematics, Aug 14 - 18, 2023

Higher Categories and Topological Order, American Institute of Mathematics, Sep 26 - 30, 2022

Quantum Topology and Geometry, Institut Henri Poincaré, June 13 - 17, 2022.

Graduate Summer School: Mathematics of Topological Phases of Matter, IPAM, Aug 29 - Sep 3, 2021.

Fusion Categories and Tensor Networks, American Institute of Mathematics, Mar 8 - 12, 2021.

SQuaRE Program, AIM (American Institute of Mathematics), Sep 30 - Oct 04, 2019.

In and around Topological Physics, Beijing International Center for Mathematical Research, July 16-20, 2019

Research School on Quantum Symmetries, Universidad de los Andes, June 24 - July 5, 2019

Summer Research Program on Quantum Symmetries, The Ohio State University, June 3-14, 2019

2nd IAMCS Workshop on Quantum Computation, Texas A&M University, May 13-15, 2019

Workshop on Subfactors and Fusion categories at BIRS in Banff, Canada, Oct 14-19, 2018

1st IAMCS Workshop on Quantum Computation, Texas A&M University, Sep 20-22, 2018.

AMS Mathematical Research Community on Quantum Symmetries, Whispering Pines, RI, June 10-16, 2018.