

## **Qing Zhang**

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150 N. University Street, West Lafayette, IN 47907

## **Employment**

**Purdue University**

2020 – Present

Golomb Visiting Assistant Professor of Mathematics

## **Education**

**Texas A&M University**

2014 – 2019

Doctor of Philosophy in Mathematics

Advisor: Eric Rowell

Dissertation: Super-modular Categories

**Beihang University**

2011–2014

Master of Science in Mathematics

**Hefei University**

2007 – 2011

Bachelor of Science in Mathematics

## **Program Participation**

**MSRI Program on Quantum Symmetries**

Spring 2020

Postdoctoral Fellow

## **Research Interests**

Category theory, representation theory, topological quantum computation, 3-manifold and link invariants

## **Papers**

- (with J. Plavnik, A. Schopieray and Z. Yu), Modular tensor categories, subcategories, and Galois orbits, arXiv:2111.05228, submitted.
- (with S.-H. Ng, E. Rowell and Y. Wang), Higher central charges and Witt groups, *Advances in Mathematics* 404 (2022): 108388.
- (with S.-H. Ng and Y. Wang), Modular categories with transitive Galois actions, *Communications in Mathematical Physics* 390.3 (2022): 1271-1310.
- (with C. Delaney, C. Galindo, J. Plavnik and E. Rowell), Braided zesting and its applications, *Communications in Mathematical Physics* 386.1 (2021): 1-55.
- (with X. Cui, P. Gustafson and Q. Yang), From torus bundles to particle-hole equivariantization, *Letters in Mathematical Physics* 112.1 (2022): 1-19.
- (with P. Bonderson, E. Rowell and Z. Wang), Congruence subgroups and super-modular categories, *Pacific Journal of Mathematics* 296, no. 2 (2018): 257-270.
- (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.

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

### Purdue University, West Lafayette, IN

#### *Instructor of Record*

Linear Algebra (MA265)	Spring 2022
Ordinary Differential Equations (MA266)	Fall 2020, Spring 2021, Fall 2021

### Texas A&M University, College Station, TX

#### *Assistant REU Instructor*

REU on Mathematics of Topological Quantum Computation	Summer 2018
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#### *Instructor of Record*

Mathematical Concepts – Calculus (M131)	Spring 2018
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#### *Teaching Assistant*

Topics in Topology and Geometry, Study Abroad, Beijing (M485)	Summer 2016
Engineering Mathematics II (M152)	Spring 2016
Engineering Mathematics I (M151)	Fall 2015, Fall 2016, Spring 2017

#### *Grader*

A Survey of Mathematical Problems I & II (M645 & M645)	Spring 2019, Fall 2017
Computational Linear Algebra (M660)	Fall 2019

### Research School on Quantum Symmetries, Universidad de los Andes, Bogotá

#### *Teaching Assistant*

The Mathematics of Topological Quantum Computing	Summer 2019
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## Honors and Awards

### Outstanding TA Award

Texas A&M University Department of Mathematics	Spring 2017
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### Lechner Graduate Grant

Texas A&M University Department of Mathematics	2014-2015
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### Second Prize Scholarship

Beihang University Department of Mathematics	2011-2012
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### National Scholarship

Hefei University Department of Mathematics	Fall 2009
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## Conference Talks

AMS Special Session on Quantum Algebra and Quantum Topology at the Spring Central Sectional Meeting. March 26 - 27, 2022

AMS Special Session on Fusion Categories and Their Applications in Physics at the 2022 Joint Mathematics Meetings. April 6 - 9, 2022.

AMS Special Session on Tensor Categories and Applications at the Fall Western Sectional Meeting. Oct 23 - 24, 2021

SIAM Conference on Applied Algebraic Geometry. Aug 16 - 20, 2021.

AMS Special Session on Hopf Algebras, Tensor Categories, and Related Homological Methods at the Spring Eastern Sectional Meeting. March 20 - 21, 2021.

AMS Special Session on Hopf Algebras and Tensor Categories at the 2021 Joint Mathematics Meetings. Jan 6 - 9, 2022.

AWM Research Symposium Special Session: Homological Methods in Noncommutative Algebra and Representation Theory. Rice University, Houston. April 6 - 7, 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. January 16 - 19, 2019.

AMS Special Session on Tensor Categories and Diagrammatic Methods at the AMS Sectional Meeting in Nashville. April 14 - 15, 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 24 - 28, 2017.

AMS Special Session on Fusion Categories and Quantum Symmetries at the 2017 Joint Mathematics Meetings in Atlanta. January 04-07, 2017.

## Seminar Talks

*From torus bundles to particle-hole equivariantization*, Quantum Topology Seminar. Indiana University Bloomington. December, 2021.

*Modular categories with transitive Galois actions*, Quantum Symmetries Student Seminar. The Ohio State University. August, 2021.

*Modular Categories with Transitive Galois Actions*, Online Seminar. MSRI. May, 2020.

*Algebraic Questions from Topological Quantum Computation*, Quantum Algebra/Quantum Topology Seminar. Ohio State University. December, 2019.

*Algebraic Questions from Topological Quantum Computation*, Algebra Seminar. Indiana University Bloomington. November, 2019

*The Algebra of Topological Quantum Computing*, Mathematical Physics Seminar. Purdue University. November, 2019.

*Topological Quantum Computing and Braid Group Representations*, Graduate Student Seminar. Texas A&M University. March, 2019.

*Classification of Super-modular Categories*, Algebra and Combinatorics Seminar. Texas A&M University. February, 2019.

## **Workshop Participation**

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

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

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

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

In and around Topological Physics, Beijing International Center for Mathematical Research, Beijing, China, 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, October 14-19, 2018

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

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