

Zhaoting Wei

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Personal Information

Name **Zhaoting Wei**, *I also go by the name of George*

Employment

Fall 2020- **Tenure Track Assistant Professor**, *Texas A&M University-Commerce*, Commerce, TX

Fall 2016- **Teaching Assistant Professor**, *Kent State University at Geauga*, Burton, OH
Spring 2020

Fall 2013- **Zorn Postdoctoral Fellow**, *Indiana University Bloomington*, Bloomington, IN
Spring 2016

Visiting Positions

Visiting Researcher, *Institut des Hautes Études Scientifiques*, Bures-sur-Yvette, France, July-Aug. 2019, Dec. 2017-Jan. 2018, Dec. 2016-Jan. 2017, Jan.-June 2014

Education

2007-2013 **Ph.D in Mathematics**, *University of Pennsylvania*, Philadelphia, PA
Advisor: Prof. Jonathan Block
Thesis title: Baum-Connes Conjecture, Flag Varieties and Representations of Semisimple Lie Groups

2003-2007 **B.S. in Mathematics**, *Peking University*, Beijing, China

Honors and Awards

2008 **Presidential Prize**, *University of Pennsylvania*

2007-2011 **Benjamin Franklin Fellowship**, *University of Pennsylvania*

2005-2006 **Chun-Tsung Scholarship**, *Peking University*

2004 **Wusi Scholarship**, *Peking University*

Research Interests

Noncommutative Geometry, Higher Category Theory

Funding

2024-2027 **AMS-Simons Research Enhancement Grant for Primarily Undergraduate Institution Faculty**

Publications

[Research Monograph](#)

- [1] Jean-Michel Bismut, Shu Shen, and Zhaoting Wei. *Coherent sheaves, superconnections, and Riemann-Roch-Grothendieck*, volume 347 of **Progress in Mathematics**. Birkhäuser/Springer, Cham, 2023. 184 pages. [book link](#) and [arXiv link](#).

Journal Papers

- [2] Zhaoting Wei. Tensor products of infinite dimensional modules in the BGG category of a quantized algebra of type ADE. *International Electronic Journal of Algebra*, 35:108–120, 2024. [journal link](#).
- [3] Zhaoting Wei. Descent of dg cohesive modules for open covers on complex manifolds. *European Journal of Mathematics*, 9(3):77, 2023, [journal link](#) and [arXiv link](#).
- [4] Zhaoting Wei. Twisted complexes and simplicial homotopies. *European Journal of Mathematics*, 7(3):1102–1123, 2021. [journal link](#) and [arXiv link](#).
- [5] Zhaoting Wei. Tensor-closed objects in the BGG category of a quantized semisimple Lie algebra. *International Electronic Journal of Algebra*, 29:175–186, 2021. [journal link](#) and [arXiv link](#).
- [6] Zhaoting Wei. A proof of the Baum-Connes conjecture for real semisimple Lie groups with coefficients on flag varieties. *Methods of Functional Analysis and Topology*, 26:389–404, 2020, [journal link](#) and [arXiv link](#).
- [7] Zhaoting Wei. Scalar extensions of categorical resolutions of singularities. *Journal of Pure and Applied Algebra*, Volume 222(7):1565–1578, 2018. [journal link](#) and [arXiv link](#).
- [8] Jonathan Block, Julian Holstein, and Zhaoting Wei. Explicit homotopy limits of dg-categories and twisted complexes. *Homology, Homotopy and Applications*, Volume 19(2):343–371, 2017. [journal link](#) and [arXiv link](#).
- [9] Zhaoting Wei. Twisted complexes on a ringed space as a dg-enhancement of the derived category of perfect complexes. *European Journal of Mathematics*, 2(3):716–759, 2016. [journal link](#) and [arXiv link](#).
- [10] Zhaoting Wei. The full exceptional collections of categorical resolutions of curves. *Journal of Pure and Applied Algebra*, Volume 220(9):3332–3344, 2016. [journal link](#) and [arXiv link](#).
- [11] Zhaoting Wei. The noncommutative poisson bracket and the deformation of the family algebras. *Journal of Mathematical Physics*, 56(7):071703, 21, 2015. [journal link](#) and [arXiv link](#).

Preprints

- [12] Zhaoting Wei. Deformations of cohesive modules on compact complex manifolds. [arXiv:2308.01266](#), submitted, 2023.
- [13] Zhaoting Wei. A recurrent formula of A_∞ -quasi inverses of dg-natural transformations between dg-lifts of derived functors. [arXiv:1903.01639](#), 2019.
- [14] Zhaoting Wei. Covariant Weil algebras. [arXiv:1211.3552](#), 2012.

Papers in Preparation

- [15] Qiaochu Ma, Xiang Tang, Hsian-Hua Tseng, and Zhaoting Wei. Orbifold cohesive modules and Riemann-Roch-Grothendieck. in preparation.

- [16] Zhaoting Wei. Superconnections and global matrix factorizations. to appear.
- [17] Jonathan Block and Zhaoting Wei. Stable superconnections and the Kobayashi-Hitchin correspondence for coherent sheaves. in preparation.

Review Experiences

Reviewing papers for the Illinois Journal of Mathematics, Journal of Noncommutative Geometry, Épijournal de Géométrie Algébrique, Arkiv för Matematik, Zentralblatt MATH, and Mathematical Reviews/MathSciNet.

Services

- Fall 2021 Coach and local supervisor of the Texas A&M University-Commerce team of the 82th Putnam Mathematical Competition.

Selected Presentations

- March 2024 **Residue currents of coherent sheaves via superconnection**, Meeting on Analysis and noncommutative Geometry for Early Career researchers
California Institute of Technology, Pasadena, CA
- March 2024 **Superconnections in geometry**, Geometry and Topology Seminar
University of California Irvine, Irvine, CA
- June 2023 **Deformations of antiholomorphic superconnections**, Noncommutative Geometry Festival 2023
Washington University in St. Louis, St. Louis, MO
- January 2023 **Coherent matrix factorizations and superconnections**, Algebra and Geometry Seminar
California Institute of Technology, Pasadena, CA
- September 2022 **Grothendieck-Riemann-Roch theorem for complex manifolds**, Workshop on Hypoelliptic Operators
Washington University in St. Louis, St. Louis, MO
- May 2022 **Equivariant K-theory on flag varieties of semisimple Lie groups**, Great Plains Operator Theory Symposium
Washington University in St. Louis, St. Louis, MO
- April 2021 **Grothendieck-Riemann-Roch theorem and index theorem**, *Online talk*
Geometry-Topology Seminar, University of Pennsylvania
- December 2020 **Determinant line bundles and cohesive modules**, *Online talk*
Online Noncommutative Geometry Seminar, Washington University in St. Louis/Texas A&M University
- February 2020 **Maurer-Cartan equation and perfect complexes**
Algebra/Topology seminar, University of Copenhagen, Copenhagen, Denmark
- January 2020 **Idempotent elements and holomorphic structures on quantum complex projective spaces**, Joint Mathematics Meetings, AMS Special Session on Noncommutative Geometry and Applications
Denver, CO

- September 2019 **Holomorphic structures on quantum projective spaces**, AMS Sectional Meeting, Special Session on Connections between Noncommutative Algebra and Algebraic Geometry
University of Wisconsin, Madison, WI
- July 2019 **Twisted complexes and simplicial homotopy (Poster Presentation)**, Conference on Integrability, Geometry and Moduli
Max Planck Institute for Mathematics, Bonn, Germany
- July 2019 **Cohesive modules and noncommutative geometry**
Noncommutative Geometry Seminar, Université Libre de Bruxelles, Brussels, Belgium
- October 2018 **Base changes of categorical resolutions of singularities**, AMS Sectional Meeting, Special Session on Homological Aspects of Noncommutative Algebra and Geometry
San Francisco State University, San Francisco, CA
- August 2018 **Coherent sheaves and cohesive modules on complex manifolds**, Workshop on Global Analysis on Manifolds
University of Science and Technology of China, Hefei, China
- October 2016 **Twisted complexes and homotopy limits of dg-categories**, AMS Sectional Meeting, Special Session on Quantum Field Theories and Geometric Representation Theory
University of St. Thomas, Minneapolis, MN
- March 2016 **Twisted complexes and the descent of dg-categories**
Algebra Seminar, University of Waterloo, Waterloo, ON, Canada
- January 2016 **Homotopy limit of cosimplicial dg-categories and higher descent**
Algebraic Geometry Seminar, Purdue University, West Lafayette, IN
- January 2016 **Twisted complexes and the homotopy limit of some cosimplicial dg-categories**, Joint Mathematics Meetings, AMS Session on Associative and Nonassociative Algebra and Rings
Seattle, WA
- July 2015 **Twisted complexes in algebraic geometry (Poster Presentation)**, 2015 Summer Research Institute on Algebraic Geometry
University of Utah, Salt Lake City, UT
- May 2014 **A differential graded category with geometric nature**
Réseau d'Étudiants en Géométrie Algébrique, Paris, France
- March 2014 **Differential graded categories and geometry**
Séminaire de Mathématiques, Institut des Hautes Études Scientifiques, Bures-sur-Yvette, France
- March 2014 **Hochschild homology and loop spaces**
Séminaire MathJeunes, Paris, France
- October 2013 **Riemann-Roch theorem and Duflo's isomorphism theorem**, AMS Sectional Meeting, Special Session on Higher Structures in Algebra, Geometry and Physics
Temple University, Philadelphia, PA
- November 2012 **Real group orbits on flag varieties and equivariant K-theory**
Noncommutative Geometry Seminar, Pennsylvania State University, University Park, PA
- September 2012 **Pseudo-operads, operads, examples**
Algebra Seminar, Temple University, Philadelphia, PA
- March 2011 **Weil algebras and covariant Weil algebras, quantizations (2 talks)**
Noncommutative Geometry Seminar, University of Pennsylvania

Teaching Experience

At Texas A&M University-Commerce

Math-572 Modern Applications of Mathematics , *Graduate Level Course*, Instructor
Summer 2021

Math-532 Fourier Analysis and Wavelets, *Graduate Level Course*, Instructor
Summer 2022

Math-515 Dynamical Systems, *Graduate Level Course*, Instructor
Summer 2023

Math-511 Real Analysis I, *Graduate Level Course*, Instructor
Fall 2023

Math-512 Real Analysis II, *Graduate Level Course*, Instructor
Spring 2024

Math-437 Elementary Number Theory, Instructor
Spring 2021

Math-334 Introduction to Abstract Algebra, Instructor
Spring 2022

Math-333 Advanced Linear Algebra, Instructor
Fall 2022

Math-317 Numerical Analysis, Instructor
Spring 2021, Fall 2021, Spring 2022, Spring 2023

Math-2413 Calculus I, Instructor
Spring 2024

Math-2414 Calculus II, Instructor
Fall 2022, Spring 2023, Fall 2023

Math-2320 Differential Equations, Instructor
Spring 2024

Math-2312 Pre-Calculus, Instructor
Fall 2020, Fall 2021, Spring 2022, Fall 2022, Spring 2023, Fall 2023

Math-2305 Discrete Math, Instructor
Summer 2023

Math-1325 Mathematics for Business Applications II, Instructor
Fall 2020

At Kent State University-Geauga

Math 12002 Analytic Geometry and Calculus I, Instructor
Fall 2018

Math 10775 Algebra for Calculus Plus, Instructor
Fall 2017, Spring 2018, Spring 2019, Fall 2019

Math 10774 Algebra for Calculus Stretch II, Instructor
Spring 2017, Spring 2018, Spring 2019

Math 10773 Algebra for Calculus Stretch I, Instructor
Fall 2016, Fall 2018

Math 10772 Modeling Algebra Plus, Instructor

Fall 2016, Spring 2017, Fall 2017, Fall 2019

Math 10675 Algebra for Calculus Boost, Instructor

Fall 2019, Spring 2020

Math 10041 Introductory Statistics, Instructor

Fall 2017, Spring 2018, Fall 2018, Spring 2019

Math 11010 Algebra for Calculus, Instructor

Fall 2016, Spring 2017, Fall 2017, Fall 2018

Math 11009 Modeling Algebra, Instructor

Fall 2016

Math 00022 Basic Algebra II, *Emporium Teaching*, Instructor

Spring 2017, Spring 2018, Spring 2019, Spring 2020

Student Success Center, Math Tutor

Spring 2017

[At Indiana University Bloomington](#)

M701 Selected Topics in Algebra (Derived and dg-categories), *Graduate Level Course*, Instructor

Fall 2014

M311 Calculus III, Instructor

Fall 2013

M301 Linear Algebra and Applications, Instructor

Spring 2015, Spring 2016

M211 Calculus I, Instructor

Fall 2013, Fall 2014, Fall 2015

[At the University of Pennsylvania](#)

Math 619 Algebraic Topology, Part I, Grader

Spring 2013

Math 601 Introduction to Algebraic Topology, Grader

Spring 2012

Math 600 Topology and Geometric Analysis, Grader

Fall 20

Math 425 Partial Differential Equations, Grader

Spring 2010

Math 371 Abstract Algebra II, Teaching Assistant

Fall 2012

Math 361 Advanced Calculus II, Teaching Assistant

Fall 2008

Math 360 Advanced Calculus I, Teaching Assistant

Fall 2012

Math 114 Calculus II, Teaching Assistant

Fall 2008

Math 104 Calculus I

Instructor in Summer 2011, Teaching Assistant in Spring 2009 and Fall 2009, Grader in Spring 2013

Maple Help Session, Tutor
Summer 2010 and Summer 2012

Computer Skills

Expert C++, MATLAB, Maple
Basic HTML, Singular, GAP

Languages

Chinese Native
English Fluent
French Working