Yu Zhang

Personal Information

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Employment

2023.09 – present	**Assistant Professor** Tianjin University, *Tianjin, China*
2020.09 – 2023.09	**Postdoctoral Researcher** Nankai University, *Tianjin, China*

Education

2014.08 – 2020.05	**The Ohio State University** *Columbus, Ohio, USA* Ph.D. in Mathematics, Dissertation Advisor: John E. Harper
2010.09 – 2014.07	**Peking University** *Beijing, China* B.S. in Mathematics, Dissertation Advisor: Huijun Fan

Grants

2025.01 – 2027.12	National Natural Science Foundation of China (No. 12401085): Research on odd primary components of the stable homotopy groups of spheres based on motivic homotopy theory and computer-assisted calculations; **Principal Investigator**.
2024.01 – 2025.12	Tianjin University Technology Innovation Leading Talent Cultivation Plan Qiming Program (No. 2024XQM-0009): Computing the stable homotopy groups of spheres; **Principal Investigator**.
2023.01 – 2026.12	National Natural Science Foundation of China (No. 12261091): Some problems on the spectral sequences and the cohomology of the classifying space BPU_n; **Co-Principal Investigator**.
2023.01 – 2026.12	National Natural Science Foundation of China (No. 12271183): Cohomology of toric spaces and motivic stable homotopy; **Co-Investigator**.
2021.05 – 2023.04	Project on Postdoctoral International Exchanges: Properties of nilpotent structured ring spectra. **Principal Investigator**.
2019.01 – 2022.12	National Natural Science Foundation of China (No. 11871284): Researches on Motivic stable homotopy and R-S spectral sequence in Toric topology; **Co-Investigator**.

Research Papers

- **The secondary periodic element β_{p^2/p^2-1} and its applications**
  (joint with J. Hong and X. Wang), *SCIENCE CHINA Mathematics.* 68, 207-222 (2025).

- **Detecting nontrivial products in the stable homotopy ring of spheres via the third Morava stabilizer algebra**
  (joint with X. Wang, J. Wu, and L. Zhong), *Proceedings of the American Mathematical Society.* 152 (2024), 4521-4536.

- **A correspondence between higher Adams differentials and higher algebraic Novikov differentials at odd primes**
  (joint with X. Wang), *Proceedings of the American Mathematical Society.* 151 (2023), 5087-5096.

- **The p-primary subgroup of the cohomology of BPU_n in dimension $2p+6$**
  (joint with Z. Zhang and L. Zhong), *Topology and Its Applications.* 338 (2023): 108642.

- **Some nontrivial secondary Adams differentials on the fourth line**
  (joint with X. Wang and Y. Wang), *New York Journal of Mathematics.* 29 (2023) 687-707.

- **Homotopy pro-nilpotent structured ring spectra and topological Quillen localization**
  Journal of Homotopy and Related Structures. 17(4), 511-523 (2022).

- **The p-primary subgroups of the cohomology of BPU_n in dimensions less than $2p+5$**
  (joint with X. Gu, Z. Zhang, and L. Zhong), *Proceedings of the American Mathematical Society.* 150(9), 4099-4111 (2022).

- **Topological Quillen localization of structured ring spectra**
  (joint with J. E. Harper), *Tbilisi Mathematical Journal.* 12(3), 69-91 (2019).

Invited talks

May 26, 2025	**Zhejiang University**, Geometry and Topology seminar, "Extensive Computations of the Adams Spectral Sequence E_2-Page at Odd Primes"
May 09, 2025	**Fudan University**, Topology seminar, "Extensive Computations of the Adams Spectral Sequence E_2-Page at Odd Primes"
Mar 13, 2025	**Tsinghua Sanya International Mathematics Forum**, Stable homotopy groups of spheres: Theories and Computations, where to now?, "Computing the Adams E_2-Page for Odd Primes"
Oct 18, 2024	**Yanbian University**, Topology seminar (online), "The convergence of h_0h_3 in the odd primary Adams spectral sequence"
Dec 06, 2023	**Peking University**, Geometry and Topology seminar, "The algebraic Novikov spectral sequence and stable homotopy groups of spheres at odd primes"

May 14, 2023 **Nankai University**, 2023 Topology and its Applications Conference, "Motivic method and stable homotopy groups of spheres"

Nov 19, 2022 **Tianjin University of Technology**, Annual Meeting of Math and Statistics in Tianjin, "Stable homotopy groups of the sphere at odd primes"

Aug 10, 2022 **Inner Mongolia Minzu University**, National Conference for Young Topologists, "Some Differentials in the Algebraic Novikov Spectral Sequence and Its Applications"

Nov 23, 2021 **Chern Institute of Mathematics**, Higher Structures in Geometry and Physics (online), "Structured ring spectra and Topological Quillen homology"

Jul 25, 2021 **Shanghai Center for Mathematical Sciences**, IWoAT 2021 Junior Researcher Forum, "Some spectral sequence computations towards stable homotopy groups of spheres at odd primes"

Jul 17, 2021 **Northeast Normal University**, National Conference for Young Topologists, "Some spectral sequence computations towards stable homotopy groups of spheres at odd primes"

Dec 16, 2020 **Vietnam National University**, The 8th East Asian Conference on Algebraic Topology (online), "Koszul duality and TQ-homological Whitehead theorem of structured ring spectra"

Nov 4, 2020 **University of Regina**, Topology Seminar (online), "Koszul duality and TQ-homological Whitehead theorem of structured ring spectra"

Nov 21, 2019 **Binghamton University**, Geometry and Topology Seminar, "Topological Quillen localization of structured ring spectra"

Nov 19, 2019 **The University of Chicago**, Algebraic Topology Seminar, "Topological Quillen localization of structured ring spectra"

Nov 1, 2019 **Penn State Altoona**, Topology Seminar, "Topological Quillen localization of structured ring spectra"

Oct 30, 2019 **Indiana University Bloomington**, Topology Seminar, "Topological Quillen localization of structured ring spectra"

Oct 29, 2019 **University of Illinois at Urbana-Champaign**, Topology Seminar, "Topological Quillen localization of structured ring spectra"

Jul 29, 2019 **Norwegian University of Science and Technology**, Equivariant Topology and Derived Algebra conference, "Topological Quillen completion and localization of structured ring spectra"

Mar 30, 2019 **University of Illinois at Urbana-Champaign**, Graduate Student Topology and Geometry Conference, "An easy proof of the homological Whitehead theorem for nilpotent spaces"

Sep 27, 2018 **The Ohio State University**, Homotopy Theory Seminar, "Localization of structured ring spectra with respect to TQ homology"

Jul 10, 2018 **University of Copenhagen**, Young Topologists Meeting, "Bousfield localization of structured ring spectra"

Conference organization

May 2023   **2023 Topology and its Applications Conference**, Nankai University, Co-organizer

Conference participation

Jul 2025   **International Workshop on Algebraic Topology 2025**, at Zhejiang University

Jul 2025   **IWoAT Summer School 2025: Computations with the Adams Spectral Sequence and the Last Kervaire Invariant Problem**, at Westlake University

Mar 2025   **Stable homotopy groups of spheres: Theories and Computations, where to now?**, at Tsinghua Sanya International Mathematics Forum

Mar 2025   **Special international conference in honor of Prof. Peter May**, at Southern University of Science and Technology

Sep 2024   **Computer assisted studies in Geometry and Topology**, at Tianyuan Mathematics Research Center

Jul 2024   **International Workshop on Algebraic Topology 2024**, at Shanghai Center for Mathematical Sciences, Fudan University

Jun 2024   **IWoAT 2024 summer school on motivic homotopy theory**, at Shanghai Center for Mathematical Sciences, Fudan University

Dec 2023   **International Workshop on Algebraic Topology 2023 Winter School**, at Southern University of Science and Technology

Aug 2023   **IWoAT Summer School 2023: Operads, spectra, and multiplicative structures**, at Yanqi Lake Beijing Institute of Mathematical Sciences and Applications

Jul 2023   **International Workshop on Algebraic Topology 2023**, at Beijing International Center for Mathematical Research

May 2023   **2023 Topology and its Applications Conference**, at Nankai University

Nov 2022   **Annual Meeting of Math and Statistics in Tianjin**, organized jointly by Tianjin University of Technology and Nankai University

Aug 2022   **Summer School on Chromatic Homotopy Theory and Higher (Infinity-Categorical) Algebra (online)**, organized by Shanghai Center for Mathematical Sciences, Fudan University, and Yanqi Lake Beijing Institute of Mathematical Sciences and Applications

Aug 2022   **National Conference for Young Topologists**, at Inner Mongolia Minzu University

Jul 2022   **Mid-South Algebraic Topology and Geometry Workshop (online)**, organized by Huazhong University of Science and Technology and South China University of Technology

Nov 2021	**Higher Structures in Geometry and Physics (online)**, organized by Chern Institute of Mathematics
Jul 2021	**IWoAT 2021 Junior Researcher Forum (online)**, organized by Shanghai Center for Mathematical Sciences
Jul 2021	**Summer School on Equivariant Homotopy Theory**, at Shanghai Center for Mathematical Sciences
Jul 2021	**National Conference for Young Topologists**, at Northeast Normal University
Dec 2020	**The 8th East Asian Conference on Algebraic Topology (online)**, organized jointly by Vietnam National University and Vietnam Institute for Advanced Study in Mathematics
Aug 2020	**The First Joint Workshop on Topology and Data Science**, at Chongqing University of Technology
May 2020	**Midwest Topology Seminar (online)**, organized by Wayne State University
Oct 2019	**Mayday 2019**, at The University of Chicago
Sep 2019	**AMS Fall Central Sectional Meeting**, at University of Wisconsin-Madison
Aug 2019	**International Workshop on Algebraic Topology**, at Shanghai Center for Mathematical Sciences
Aug 2019	**Summer School on Equivariant Homotopy Theory**, at Shanghai Center for Mathematical Sciences
Jul 2019	**Equivariant Topology & Derived Algebra**, at Norwegian University of Science and Technology
Jul 2019	**Young Topologists Meeting**, at École polytechnique fédérale de Lausanne
May 2019	**Midwest Topology Seminar**, at Michigan State University
Apr 2019	**Shanks Workshop on Homotopy Theory**, at Vanderbilt University
Mar 2019	**Graduate Student Topology and Geometry Conference**, at University of Illinois at Urbana-Champaign
Mar 2019	**Workshop on Functor Calculus**, at The Ohio State University
Sep 2018	**Midwest Topology Seminar**, at University of Kentucky
Jul 2018	**Young Topologists Meeting**, at University of Copenhagen
Apr 2018	**Midwest Topology Seminar**, at Indiana University Bloomington
Mar 2018	**AMS Special Session on Homotopy Theory**, at The Ohio State University
Mar 2018	**Midwest Topology Seminar**, at Northwestern University
Nov 2017	**Midwest Topology Seminar**, at Wayne State University
Jul 2017	**Homotopy Theory: Tools and Applications**, at University of Illinois at Urbana-Champaign

May 2017	**The MIT Talbot Workshop: Obstruction theory for structured ring spectra**, at Gooding Talbot house
Mar 2017	**Shanks Workshop on Homotopy Theory**, at Vanderbilt University
Feb 2017	**Conference for Young researchers in homotopy theory and categorical structures**, at Max Planck Institute for Mathematics

Teaching Experience

As lecturer in Tianjin University

Autumn 2024	**Calculus I** Student Evaluation: 97.6/100

As lecturer in Nankai University

Spring 2022	**Probability and Statistics for Liberal Arts** Student Evaluation: 97.7/100
Autumn 2021	**Advanced Mathematics for Liberal Arts** Student Evaluation: 99.0/100

As teaching associate at The Ohio State University

Autumn 2018	**MATH 2177: Mathematical Topics for Engineers**
Autumn 2017	**MATH 1172: Engineering Mathematics A**
Autumn 2016	**MATH 1172: Engineering Mathematics A**
Spring 2016	**MATH 1152: Calculus II**

Languages

English: fluent (speaking, reading, writing)

French: basic (reading)

Mandarin: native language