Yu Zhang

| | Personal Information |
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| Email | zhangyumath@tju.edu.cn |
| Homepage | https://yuzhangmath.github.io/ |
| Address | Center for Applied Mathematics, Tianjin University, No.92 Weijin Road, Tianjin 300072, P.R.China |
| | 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 <i>Columbus, Ohio, USA</i> Ph.D. in Mathematics, Dissertation Advisor: John E. Harper |
| 2010.09 - 2014.07 | Peking University <i>Beijing, China</i> 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 prob- lems 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 struc- tured 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 $p\text{-primary subgroups of the cohomology of }BPU_n$ 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

- 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, Coorganizer

Conference participation

- Sep 2024 **Computer assisted studies in Geometry and Topology**, at Tianyuan Mathematics Research Center
- Jul 2024 International conference at Fudan University, 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

As lecturer in Nankai University

Spring 2022 **Probability and Statistics for Liberal Arts** Student Evaluation: 97.7/100 Autumn 2021Advanced Mathematics for Liberal Arts
Student Evaluation: 99.0/100As teaching associate at The Ohio State UniversityAutumn 2018Autumn 2017MATH 2177: Mathematical Topics for EngineersAutumn 2017MATH 1172: Engineering Mathematics AAutumn 2016MATH 1172: Engineering Mathematics ASpring 2016MATH 1152: Calculus II

Languages

English: fluent (speaking, reading, writing)French: basic (reading)Mandarin: native language