

## Personal Information

Email [zhang.4841@buckeyemail.osu.edu](mailto:zhang.4841@buckeyemail.osu.edu)  
Homepage <https://yuzhangmath.github.io/>  
Address Center for Applied Mathematics, Tianjin University, No.92 Weijin Road,  
Tianjin 300072, P.R.China

## Fields of Interests

**Algebraic topology:** classical and motivic homotopy theory computing the stable homotopy groups of spheres; model categories and higher category theory; higher structures of spaces and ring spectra.

## 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

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**.

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## Research Papers

- **The secondary periodic element  $\beta_{p^2/p^2-1}$  and its applications**  
(joint with J. Hong and X. Wang), Submitted.
- **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), Submitted.
- **A correspondence between higher Adams differentials and higher algebraic Novikov differentials at odd primes**  
(joint with X. Wang), To appear in *Proceedings of the American Mathematical Society*.
- **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).

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## Invited talks

- 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"

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## Conference organization

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

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## Conference participation

- 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

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## Teaching Experience

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**

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## Languages

**English:** fluent (speaking, reading, writing)

**French:** basic (reading)

**Mandarin:** native language