Zhixu Su, Ph.D.

Acting Assistant Professor
Department of Mathematics, University of Washington

zhixusu@uw.edu
Tel: 812-361-4016

Education

- Ph.D. in Mathematics, Indiana University, Bloomington, July 2009
  Dissertation: "Rational homotopy type of manifolds". Thesis Advisor: James F. Davis
- B.Sc. in Mathematics, Beijing Institute of Technology, China, May 2003

Employment

- Acting Assistant Professor, University of Washington, September 2020 – present
- Senior Lecturer (promoted 2019), Lecturer, Indiana University Bloomington, August 2014 – May 2020
- Lecturer, University of California Irvine, August 2012 – July 2014
- Assistant Professor (promoted 2011), Visiting Assistant Professor, Rose-Hulman Institute of Technology August 2009 – July 2012

Research Interests

Geometric topology, high dimensional manifolds, rational homotopy theory.

Teaching Experiences

— *University of Washington*

- MATH 444 Introduction to Geometries I Winter 2023
- MATH 399 Undergraduate Research (WXML) Autumn 2022
- MATH 126 Calculus with Analytic Geometry III (160 students) Autumn 2020, 2021, 2022, Spring 2022
- MATH 324/224 Advanced Multivariable Calculus I Winter 2021, Spring 2021
- MATH 120 PreCalculus Winter 2022

— *Indiana University*

- E201 Linear Algebra for Data Science Spring 2020
- M303 Linear Algebra Spring 2019, 2020; Summer 2016, 2017
- M311 Calculus III Spring 2019, Spring 2015
- M212 Calculus II Spring 2017
- M211 Calculus I Fall, 2017, Fall 2016
- M119 Brief Survey of Calculus I (250+ students) Fall/Spring 2017, Fall 2016, 2014
- M118 Finite Math (250+ students) Fall/Spring 2015

— *University of California, Irvine*

- Introduction to Abstract Math – Mathematical Proofs — Fall 2013
- Calculus II (150+ students) — Spring 2014, Fall 2013,
- Calculus I (150+ students) — Fall 2012, Spring 2013
- Number Theory — Summer 2012

— *Rose-Hulman Institute of Technology*

- Topics in Topology – Algebraic Topology — Spring 2012
- Low Dimensional Topology — Winter 2011
- Discrete and Combinatorial Math — Fall 2011
- Problem Solving Seminar (Putnam exam preparation) — Fall 2011
- Complex Analysis — Spring 2011
- Calculus III — Winter 2010, Winter 2011
- Calculus II — Winter 2009, Fall 2010
- Linear Algebra — Spring 2010
- Differential Equations II and Matrix Algebra — Winter 2009, Spring 2010, Winter 2010
- Differential Equations I — Fall 2009, Spring 2011, Spring 2012
- Calculus I — Fall 2009, Fall 2011

Mentoring and Outreach

— *University of Washington*

- MATH 399 WXML, mentoring two math major seniors on the project: "Analyzing the shape of data – Persistent Homology". — Autumn 2022
- Committee member for "Math Day" 2023, event planning and communications. — Autumn 2022

— *Indiana University*

- Faculty mentor for "IU Math Club", advised math majors on running weekly meetings with talks, activities, discussions; led students attending undergraduate research conferences. — 2017-2018, 2019-2020
- Faculty organizer for "MATH DAY for Jim Holland RISE program", organized the one-day event with math talks and activities for a group of minority high school students. — June 2019
- Faculty activity leader for "IU Science Fest" (a campus-wide public outreach event). — 2018, 2019

— *Rose-Hulman Institute of Technology*

- Reviewer for "Rose-Hulman Undergraduate Mathematics Journal". — 2009-2010
- Coordinator for "Rose-Hulman High-school Mathematics Contest". — 2009-2012

Service

— *University of Washington*

- Member of Undergraduate Admissions Committee, reviewed and scored applications. 2022-2023
- Member of Undergraduate Program Committee – subcommittee on Honors and Awards 2022-2023
- Member of Undergraduate Program Committee 2021-2022

  subcommittee on GSP (Self-Guided placement), drafted a second set of assessment and survey questions for perspective MATH 120 students.

  subcommittee on "Integrating PreCalculus and Calculus", discussed and researched how to develop a new course integrating MATH 120 and MATH 124 in the future.

— *Indiana University*

- Director of General Education Studies. 2019-2020

  managed and supported 100 and 200 level Math GenEd courses, drafted Calculus Placement Exam and Practice Exams; organized events for perspective math majors; assisted academic advisors in campus communications; evaluated transferred GenEd course credits from other universities.
- Course coordinator for M211 Calculus I. Fall 2017

  coordinated 10 sections taught by 5 instructors, drafted syllabus, practice exams and final exam.
- New course development: E201 Linear Algebra for Data Science.

  developed the course and taught it for the first time. 2020
- Supervisor for undergraduate teaching assistants and graders. 2019-2020

  recruited and trained undergraduate math majors as TAs or graders for 100 and 200 level math courses.
- Faculty mentor for graduate student TA training. 2018, 2019

  supervised graduate students teaching recitation sections of 200 level Calculus courses.
- Faculty leader for ACP (Advanced College Project) seminar. 2018, 2019

  led seminars and conducted class visits for high schools offering IU GenEd equivalent courses.

— *Rose-Hulman Institute of Technology*

- Member of Pure Math Curriculum Development Committee. 2011-2012

Publications

- *Almost complex manifold with Betti number $b_i = 0$ except $i = 0, n/2, n$*, arXiv:2204.04800, submitted
- (with Lee Kennard), *On dimensions supporting a rational projective plane*,
  Journal of Topology and Analysis (2017) 1-21 published Nov 2017, submitted Mar 2017
- (with Jim Fowler), *Smooth manifolds with prescribed rational cohomology ring*,
  Geometriae Dedicata 182(1), 215-232 published Jun 2016, submitted Jan 2015
- *Rational analogs of projective planes*
  Algebraic & Geometric Topology 14 (2014) 421-438 published Jan 2014, submitted Oct 2010
- *Rational homotopy types of manifolds* (Ph.D. Dissertation) July 2009

Talks

- "Almost complex manifolds with prescribed Betti numbers", Topology seminar, Tsinghua University, Oct 2022
- "Manifolds with prescribed Betti numbers", Topology seminar, Stony Brook University, Sep 2019
- "Smooth or almost complex manifolds with prescribed Betti numbers", Almost complex geometry seminar, Graduate Center of CUNY, Sep 2019
- "Rational Surgery and manifold realization problem", Topology seminar, South China Normal University, China, Jun 2018
- "Manifold realization of prescribed Betti numbers", The fifth symposium of young scholars in topology, Guangzhou China, Jun 2018
- "Manifold realization of prescribed Betti numbers", Topology Seminar, Beijing Jiaotong University, China, Mar 2018
- "Bernoulli number, signature and manifold", Math Club, Indiana University Apr 2017
- "Manifolds with prescribed rational cohomology ring", BIRS workshop on Surgery and Geometry, Banff, Canada, Jul 2016
- "A brief History of Four Color Theorem", job talk, Indiana University Apr 2016
- "Manifolds with prescribed rational cohomology ring", 50th Spring Topology and Dynamical Systems Conference, Baylor University, TX, Mar 2016
- "Rational analogs of projective planes", Topology Seminar, University of California, Irvine, Nov 2012
- "Rational homotopy type of high dimensional manifolds", Topology Seminar, University of California, Riverside, Oct 2012
- "Non-simply-connected rational surgery", Topology Seminar, Ohio State University, Aug 2011
- "Rational homotopy type of high dimensional manifolds", mini-conference on Geometrical methods in high-dimensional topology, Ohio State University, May 2011
- "Rational analogs of projective planes", Topology Seminar, University of Notre Dame, Nov 2009
- "Rational analogs of projective planes", AMS Joint Mathematics Meetings, Session on Algebraic and General Topology, Washington, DC, Jan 2009
- "Rational surgery theory and applications", Topology Seminar, Indiana University, Oct 2008

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