

FAN YE

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RESEARCH INTERESTS

Low-dimensional topology, especially knot theory, gauge theory and, Floer homology

EMPLOYMENT

Assistant Professor, Peking University	01/2025-now
Simons Collaboration Postdoc, Harvard University, supported by Peter Kronheimer	07/2024-12/2025
Benjamin Peirce Fellow, Harvard University, advised by Peter Kronheimer	07/2022-12/2025

EDUCATION

Ph.D. in DPMMS, University of Cambridge, supervised by Jacob Rasmussen	10/2019-06/2022
B.S. in School of Mathematical Sciences (SMS), Peking University	09/2015-06/2019

FUNDINGS

AMS-Simons Travel Grant	07/2024-06/2026
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PUBLICATIONS AND PREPRINTS

- [15] **Instanton 2-torsion and fibered knots** *Joint with Deeparaj Bhat and Zhenkun Li, submitted, arXiv: 2512.24206.*
- [14] **Singular instanton homology of dual knots** *Single author, submitted, arXiv:2511.19883.*
- [13] **Instanton dimensions of knot surgeries over arbitrary fields** *Joint with Zhenkun Li, submitted, arXiv:2511.17877.*
- [12] **Instanton 2-torsion and Dehn surgeries** *Joint with Zhenkun Li, submitted, arXiv:2508.03394.*
- [11] **2-torsion in instanton Floer homology** *Joint with Zhenkun Li, Adv. Math. 472:Paper No. 110289, 55, 2025, arXiv:2405.16252.*
- [10] **Knot surgery formulae for instanton Floer homology II: applications** *Joint with Zhenkun Li, Math. Ann. 391:6291–6371, 2025, arXiv:2209.11018.*
- [9] **Guts of nearly fibered knots** *Joint with Zhenkun Li, Algebr. Geom. Topol. to appear, arXiv:2208.05382.*
- [8] **Knot surgery formulae for instanton Floer homology I: the main theorem** *Joint with Zhenkun Li, Geom. Topol. 29(5): 2269–2342, 2025, arXiv:2206.10077.*
- [7] **Small Dehn surgery and $SU(2)$** *Joint with John A. Baldwin, Zhenkun Li, and Steven Sivek, Geom. Topol. 28(4): 1891–1922, 2024, arXiv:2110.02874.*
- [6] **$SU(2)$ representations and a large surgery formula** *Joint with Zhenkun Li, submitted, arXiv:2107.11005.*
- [5] **An enhanced Euler characteristic of sutured instanton homology** *Joint with Zhenkun Li, IMRN 2024(4): 2873–2936, 2023, arXiv:2107.10490.*

- [4] **Instanton Floer homology, sutures, and Euler characteristics** *Joint with Zhenkun Li, Quantum Topol. 14 (2): 201–284, 2023, arXiv:2101.05169.*
- [3] **Sutured instanton homology and Heegaard diagrams** *Joint with John A. Baldwin and Zhenkun Li Compos. Math. 159(9), 1898–1915, 2023, arXiv:2011.09424.*
- [2] **Instanton Floer homology, sutures, and Heegaard diagrams** *Joint with Zhenkun Li, J. Topol. 15(1): 39–107, 2022, arXiv:2010.07836.*
- [1] **Constrained knots in lens spaces** *Single author, Algebr. Geom. Topol. 23(3): 1097–1166, 2023, arXiv:2007.04237.*
- [0] **Ph.D. Thesis, New techniques in calculation of sutured instanton Floer homology: by Heegaard diagrams, Euler characteristics, and Dehn surgery formulae** DOI:10.17863/CAM.85094.

CONFERENCES AND TALKS

Mini-course, Peking University	12/2025 Seminar talk, Wuhan University	05/2025
Seminar talk, Peking University		12/2024
Seminar talk, California Institute of Technology (Caltech)		10/2024
Seminar talk, University of Miami		04/2024
Seminar talk, Princeton University		04/2024
Seminar talk, Ohio State University (OSU)		02/2024
Seminar talk, University of Maryland (UMD)		02/2024
Seminar talk, Washington University in St. Louis (WUSTL)		01/2024
Seminar talk, University of Illinois Urbana-Champaign (UIUC)		10/2023
Seminar talk, Boston College		09/2023
Seminar talk, Harvard University		09/2023
Seminar talk, Academy of Mathematics and Systems Science, CAS, Beijing		07/2021
Seminar talk, Institute of Mathematics of the Polish Academy of Sciences		07/2021
Seminar talk, Max Planck Institute for Mathematics (MPIM), Bonn		06/2023
Seminar talk, California Institute of Technology (Caltech)		05/2023
Conference talk, Massachusetts Institute of Technology (MIT)		05/2023
Seminar talk, Brown University		05/2023
Conference talk, University of Miami		04/2023
Seminar talk, Stony Brook University		10/2022
Seminar talk, Peking University		04/2022
Seminar talk, Morningside Center of Mathematics Chinese Academy of Sciences		04/2022
Seminar talk, University of Warsaw		12/2021
Seminar talk, Gauge Theory Virtual		11/2021
Seminar talk, Massachusetts Institute of Technology (MIT)		11/2021
Seminar talk, California Institute of Technology (Caltech)		10/2021
Mini-course, Beijing International Center for Mathematical Research (BICMR)		10/2021
Seminar talk, Peking University		10/2021
Seminar talk, Princeton University		09/2021
Summer School on 4-manifolds, Georgia Tech		07/2021
Group report, Summer Trisectors Workshop		06/2021
Conference talk, NCNGT2021		06/2021
Seminar talk, Peking University		06/2021
Seminar talk, Stanford University		03/2021
Seminar talk, Peking University		03/2021

TEACHING EXPERIENCE

Harvard Math231A, algebraic topology	<i>Fall 2024</i>
Harvard Math285Z, sutured 3-manifolds and Floer homology (topic course)	<i>Spring 2023</i>
Harvard Math230A, differential geometry	<i>Fall 2023</i>
Harvard Math21A, multi-variable calculus	<i>Spring 2022</i>
Harvard Math230A, differential geometry	<i>Fall 2022</i>

SYNERGISTIC ACTIVITIES

Co-organizer for Harvard Gauge theory and Topology seminar	<i>09/2022-06/2024</i>
Reviewer for MathSciNet, zbMATH	
Referee for Forum Math. Pi., J. Differ. Geom., J. Topol., Quantum Topol., Math. Res. Lett., Algebr. Geom. Topol., J. Knot Theory Ramif., Proc. Amer. Math. Soc.	