

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 Trisection 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.	