FAN YE

Email: flyye@math.pku.edu.cn Homepage: scholar.harvard.edu/fanye

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, suppoerted 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*

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** *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. DOI:10.1016/j.aim.2025.110289, arXiv:2405.16252.

[10] **Knot surgery formulae for instanton Floer homology II: applications**
Joint with Zhenkun Li,
Math. Ann. 391:6291–6371, 2025. DOI: 10.1007/s00208-024-03074-6, arXiv:2209.11018.

[9] **Guts of nearly fibered knots** *Joint with Zhenkun Li,*
accepted by Algebr. Geom. Topol., 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. DOI:10.2140/gt.2025.29.2269, 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. DOI:10.2140/gt.2024.28.1891, 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. DOI:10.1093/imrn/rnad066, arXiv:2107.10490.

[4] **Instanton Floer homology, sutures, and Euler characteristics**
Joint with Zhenkun Li,
Quantum Topol. 14 (2): 201–284, 2023. DOI:10.4171/QT/182, 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. DOI:10.1112/S0010437X23007303, arXiv:2011.09424.

[2] **Instanton Floer homology, sutures, and Heegaard diagrams**
Joint with Zhenkun Li,
J. Topol. 15(1): 39-107, 2022. DOI:10.1112/topo.12218, arXiv:2010.07836.

[1] **Constrained knots in lens spaces**
Algebr. Geom. Topol. 23(3): 1097–1166, 2023. DOI:10.2140/agt.2023.23.1097, 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	*Fall 2024*
Harvard Math285Z, sutured 3-manifolds and Floer homology (topic course)	*Spring 2023*
Harvard Math230A, differential geometry	*Fall 2023*
Harvard Math21A, multi-variable calculus	*Spring 2022*
Harvard Math230A, differential geometry	*Fall 2022*

SYNERGISTIC ACTIVITIES

Co-organizer for Harvard Gauge theory and Topology seminar *09/2022-06/2024*
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.