

# FAN YE

Email: fanye@math.harvard.edu Homepage: scholar.harvard.edu/fanye

## RESEARCH INTERESTS

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

## EMPLOYMENT

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Benjamin Peirce Fellow, Harvard University

07/2022-06/2025

## EDUCATION AND EXPERIENCE

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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

Visitor, Beijing International Center for Mathematical Research (BICMR)

09/2020-04/2022

Special Student Program, Massachusetts Institute of Technology (MIT)

01/2018-12/2018

## PUBLICATIONS AND PREPRINTS

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**2-torsion in instanton Floer homology** *Joint with Zhenkun Li, submitted, arXiv:2405.16252.*

**Knot surgery formulae for instanton Floer homology II: applications**

*Joint with Zhenkun Li, submitted, arXiv:2209.11018.*

**Guts of nearly fibered knots** *Joint with Zhenkun Li, submitted, arXiv:2208.05382.*

**Knot surgery formulae for instanton Floer homology I: the main theorem**

*Joint with Zhenkun Li, submitted, arXiv:2206.10077.*

**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.*

**$SU(2)$  representations and a large surgery formula**

*Joint with Zhenkun Li, submitted, arXiv:2107.11005.*

**An enhanced Euler characteristic of sutured instanton homology**

*Joint with Zhenkun Li, IMRN 2023, rnad066. doi:10.1093/imrn/rnad066, arXiv:2107.10490.*

**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.*

**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.*

**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.*

**Constrained knots in lens spaces**

*Algebr. Geom. Topol. 23(3): 1097–1166 (2023). DOI: 10.2140/agt.2023.23.1097, arXiv:2007.04237.*

**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

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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
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

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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

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Minicourses, Beijing International Center for Mathematical Research (BICMR)	10/2021
Co-organizer for Harvard Gauge theory and Topology seminar	09/2022-Now
Referee for Forum Math. Pi., J. Differ. Geom., J. Topol., Quantum Topol., Math. Res. Lett., Algebr. Geom. Topol., J. Knot Theory Ramif.	