Joshua Wang

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Employment

Institute for Advanced Study and **Princeton University**, Princeton, NJ — 2024 – 2027
Veblen Research Instructor and NSF Postdoctoral Fellow
Postdoctoral mentor: Peter Ozsváth

Massachusetts Institute of Technology, Cambridge, MA — 2023 – 2024
NSF Postdoctoral Fellow
Postdoctoral mentor: Tomasz Mrowka

Education

Harvard University, Cambridge, MA — 2018 – 2023
Ph.D. in Mathematics
Advisor: Peter Kronheimer

Princeton University, Princeton, NJ — 2014 – 2018
A.B. in Mathematics, Highest Honors
Senior Thesis advisor: Zoltán Szabó

Publications and Preprints

8. A minimality property for knots without Khovanov 2-torsion
   with Onkar Singh Gujral
   Algebraic and Geometric Topology, accepted
7. The Gysin sequence and the sl(N) homology of T(2,m)
   Proceedings of Symposia in Pure Mathematics 109:233-251 (2024)
6. Colored sl(N) homology and SU(N) representations I: the trefoil and the Hopf link
   arXiv:2211.08409
5. Split link detection for sl(P) link homology in characteristic P
   Journal of Topology 16(2):806-821 (2023)
4. On sl(N) link homology with mod N coefficients
   Quantum Topology 15(1):87-121 (2024)
3. Link Floer homology also detects split links
   Bulletin of the London Mathematical Society 53(4):1037-1044 (2021)
2. The cosmetic crossing conjecture for split links
   Geometry & Topology 26(7):2941-3053 (2022)
1. A combinatorial proof of invariance of double-point enhanced grid homology
   with Timothy Ratigan and Luya Wang
   arXiv:1810.03202

Awards and Fellowships

NSF Mathematical Sciences Postdoctoral Research Fellowship — 2023 – 2026
Merit Research Fellowship, *Harvard University* — 2022 – 2023
Derek C. Bok Award, *Harvard University* — 2022
Certificate of Distinction in Teaching, *Harvard University* — 2021
NSF Graduate Research Fellowship Program — 2019 – 2022
George B. Covington Prize in Mathematics, *Dept of Mathematics, Princeton University* — 2018
Peter A. Greenberg '77 Prize, *Dept of Mathematics, Princeton University* — 2017
Shapiro Prize for Academic Excellence, *Princeton University* — 2016

Conference and Workshop Talks

Midwest Panorama of Geometry and Topology	June 2025
AMS-UMI Special Session on the Interface between Smooth and Symplectic 4-manifolds	July 2024
Simons Collaboration conference: New structures in low-dimensional topology	July 2024
AMS Special Session on Gauge Theory and Low-Dimensional Topology	Sep 2023
Simons Collaboration workshop: Merging Categorification, Gauge Theory, and Physics	Sep 2023
AIM workshop: Algebra, Geometry, and Combinatorics of Link Homology	Aug 2023
CMI Gauge Theory and Topology	July 2023
RTG Summer School in Low-Dimensional Topology and Symplectic Geometry	July 2023
ICTP Frontiers in Geometry and Topology Research Conference	Aug 2022
FRG Workshop on Gauge Theory in Miami, Florida	Apr 2022
AMS Special Session on Gauge Theory, Geometric Analysis, and Low-Dimensional Topology	Mar 2022
BIRS Workshop Interactions of gauge theory with contact and symplectic topology in dimensions 3 and 4	Mar 2022
ICERM Foam Evaluation Workshop	Nov 2021
JMM AMS Special Session on Low Dimensional Topology, I	Jan 2021

Invited Seminar Talks

UT Austin, Topology Seminar	Feb 2025
Einstein Chair Seminar, CUNY Graduate Center	Dec 2024
Duke University, NCSU, and UNC, Triangle Topology Seminar	Oct 2024
Stony Brook University/Simons Center for Geometry and Physics	Oct 2024
UC Berkeley, Topology Seminar	Oct 2023
California Institute of Technology, Geometry & Topology Seminar	Apr 2023
Princeton University, Topology Seminar	Mar 2023
UC Davis, Algebraic Geometry Seminar	Mar 2023
Columbia University, Symplectic Geometry, Gauge Theory, and Categorification Seminar	Feb 2023
University of Georgia, Topology Seminar	Apr 2022
Boston College, Geometry/Topology/Dynamics Seminar	Feb 2022
University of Oregon, Topology/Geometry Seminar	Feb 2022
University of Warsaw, Knot Theory Seminar	Dec 2021
Stony Brook University/Simons Center for Geometry and Physics Low-Dimensional Topology, Gauge Theory, and Symplectic Geometry Seminar	Nov 2021
Boston Graduate Topology Seminar	Nov 2021
Princeton University, Topology Seminar	Sep 2021
Gauge Theory Virtual Seminar	Apr 2021
Washington University in St. Louis, Geometry and Topology Seminar	Apr 2021
UC San Diego, Topology Seminar	Mar 2021
Stanford University, Topology Seminar	Oct 2020
Michigan State University, Geometry and Topology Seminar	Oct 2020
Virginia Commonwealth University, Geometry and Topology Seminar	Oct 2020
Max Planck Institute for Mathematics, Topology Seminar	June 2020

Teaching

MAT 216: Multivariable Analysis and Linear Algebra I, *Princeton University*	Fall 2024
18.099: Independent Study in Mathematics (Low-dimensional topology), *MIT*	Spring 2024

18.099: Independent Study in Mathematics (The geometry of complex analysis), *MIT* — Fall 2023

Math 21a: Multivariable Calculus, *Harvard University* — Fall 2021
Taught one class in a coordinate course, overall student evaluation: 4.88/5

MSRI Summer Graduate School: Gauge Theory in Geometry and Topology — Summer 2021
Served as a teaching assistant for a course taught by Boyu Zhang

Tutorial: Low-dimensional manifolds, *Harvard University* — Spring 2021
Designed the course, prepared and gave 24 lectures

Tutorial: Differential forms in algebraic topology, *Harvard University* — Summer 2020
Designed the course, prepared and gave 24 lectures

Tutorial: Knot invariants and category theory (with Morgan Opie), *Harvard University* — Summer 2019
Co-designed the course, prepared and gave 6 lectures

Service and Organization

Princeton Topology Seminar, co-organizer — 2024 – Present

Directed Reading Program at Princeton University, co-organizer — 2024 – Present

MIT PRIMES, mentor — 2024 – Present
Mentored a high school research project in Khovanov homology

MIT Geometry and Topology Seminar, co-organizer — 2023 – 2024

Directed Reading Program at MIT, co-organizer — 2023 – 2024

Harvard University Gauge Theory and Topology Seminar, co-organizer — 2022 – 2023

Directed Reading Program at Harvard University — 2018 – 2022
Co-founder and co-organizer, mentored five reading projects with undergraduates

Nearly Carbon Neutral Geometric Topology Conference (NCNGT) — 2021
Co-organized a session titled “Recent techniques in Floer and Khovanov homology”