Benjamin (Ben) Zhou

YMSC, Tsinghua University, Jingzhai, 201
Email: byzhou01@gmail.com
Website: https://byzhou01.github.io/

EDUCATION/EMPLOYMENT

YMSC, Tsinghua University *2024-2027*
Postdoc
Advisor: Shing-Tung Yau

Department of Mathematics, Northwestern University *9/2018 - 2024*
Ph.D. in Mathematics
M.S. in Mathematics, en route *2019*
Thesis: On Higher Genus Gromov-Witten Correspondences for Log Calabi-Yau Surfaces with Smooth Anti-canonical Divisor
Advisor: Eric Zaslow

Department of Computer Science, Stanford University *2015-2017*
M.S. in Computer Science
Dual Concentration in Artificial Intelligence, Theoretical Computer Science
Advisor: Serafim Batzoglou

Department of Mathematics, Stanford University *2012-2016*
B.S. in Mathematics, with Honors
Thesis: Spacetime Geometries
Advisor: András Vasy

RESEARCH INTERESTS

My research interests are in Algebraic Geometry, Mathematical Physics, Symplectic Geometry, and artificial intelligence, quantum computing, mathematical finance, mathematical biology.

PUBLICATIONS

- *Enumerative geometry of quantum periods*, joint with Tim Gräfnitz, Helge Ruddat, and Eric Zaslow, Accepted to Advances in Mathematics, arXiv:2502.19408.
- *Tropical super Gromov-Witten invariants*, joint with Artan Sheshmani, and Shing-Tung Yau, submitted, arXiv:2510.17400.
- *Higher genus Gromov-Witten invariants from projective bundles on smooth log Calabi-Yau pairs*, submitted, arXiv:2503.17713.
- *Disentagling Direct from Indirect Relationships in Association Networks*, Xiao, N., A. Zhou, M. L. Kempher. B. Zhou, Z. Jason Shi, M. Yuan, X. Guo, L. Wu, D. Ning, Ml Kl Firestone, and J. -Z. Zhou, Proc. Nat. Acad. Sci. 119, No. 2, e2109995119.
- *Illumina sequencing-based analysis of free-living bacterial community dynamics during an Akashiwo sanguine bloom in Xiamen sea, China*, C Yang, Y Li, B Zhou, Y Zhou, W Zheng, Y Tian, JD Van Nostrand, L Wu, Scientific Reports 5 (1), 8476, 2015.
- *Functionally graded, bone-and tendon-like polyurethane for rotator cuff repair*, DFE Ker, D Wang, AW Behn, ETH Wang, X Zhang, BY Zhou, Advanced Functional Materials 28 (20), 1707107

- *Random sampling process leads to overestimation of beta-diversity of microbial communities*, J Zhou, YH Jiang, Y Deng, Z Shi, BY Zhou, K Xue, L Wu, Z He, Y Yang, MBio 4 (3), 10.1128/mbio. 00324-13
- *Metagenomic-based analysis of biofilm communities for electrohydrogenesis:From wastewater to hydrogen*, C Varrone, JD Van Nostrand, W Liu, B Zhou, Z Wang, F Liu, Z He, L Wu, International Journal of Hydrogen Energy 39 (9), 4222-4233

HONORS AND AWARDS

Huiyan Talent Fund, YMSC	*2024-2027*
Grade of "Excellent" in postdoc evaluation, YMSC	*2024-2025*
"Excellence as Graduate Teaching Assistant" Departmental Award	*2021-2022*
NSF RTG: "Analysis on Manifolds" recipient, National Science Foundation	*2019*
Semifinalist, Siemens Competition in Math, Science, and Technology	*2012*
National Finalist, Siemens Competition in Math, Science, and Technology	*2011*

TEACHING

Qiuzhen Yiyou Scholar, Tsinghua University	*Spring 2026*
Qiuzhen Yiyou Scholar, Tsinghua University	*Spring 2025*
TA for Math 351: Fourier Analysis and Boundary Value Problems, Northwestern University	*Fall 2023*
TA for Math 240: Linear Algebra, Northwestern University	*Fall 2023*
TA for Math 368: Introduction to Optimization, Northwestern University	*Spring 2022*
TA for Math 340: Geometry, Northwestern University	*Spring 2022*
TA for Math 366-1: Mathematical Models in Finance, Northwestern University	*Winter 2022*
TA for Math 336-1: Introduction to the Theory of Numbers, Northwestern University	*Winter 2022*
TA for Math 342: Introduction to Differential Geometry, Northwestern University	*Fall 2021*
TA for Math 320-1: Real Analysis, Northwestern University	*Fall 2021*
TA for Math 300: Foundations of Higher Mathematics, Northwestern University	*Spring 2021*
TA for Math 230-2: Multivariable Integral Calculus, Northwestern University	*Winter 2021*
TA for Math 230-1: Multivariable Differential Calculus, Northwestern University	*Fall 2020*
TA for Math 230-1: Multivariable Differential Calculus, Northwestern University	*Fall 2019*
TA for CS 229: Machine Learning, Stanford University	*Fall 2016*

INVITED TALKS

Fifty Years of Geometric Analysis and the Celebration of the Proof of the Calabi Conjecture, CUHK
Tropical super Gromov-Witten invariants *4/15/26*

Symplectic Geometry and Mathematical Physics seminar, BICMR
Higher genus open/closed Gromov-Witten correspondences for log Calabi-Yau surfaces *11/11/25*

Derived and Noncommutative Geometry seminar, SIMIS
Higher genus open/closed Gromov-Witten correspondences for log Calabi-Yau surfaces *5/20/25*

Algebraic Geometry seminar, BIMSA
Higher genus open/closed Gromov-Witten correspondences for log Calabi-Yau surfaces *2/13/25*

Symplectic Geometry seminar, YMSC
Higher genus open/closed Gromov-Witten correspondences for log Calabi-Yau surfaces *10/16/24*

Algebraic Geometry Seminar, University of Georgia
Higher genus open/closed Gromov-Witten correspondences for log Calabi-Yau surfaces *11/1/2023*

Geometry/Physics Seminar, Northwestern University
Higher genus open/closed Gromov-Witten correspondences for log Calabi-Yau surfaces *10/26/2023*

Graduate Student Seminar, Northwestern University
Curve Counting and Modular Forms *6/2023*

Graduate Student Seminar, Northwestern University
Every smooth cubic surface has exactly 27 lines *5/2021*

CONFERENCES ATTENDED

ICCM, Shanghai *1/2-1/8/2026*

String-Math, BIMSA *2025*

Topological Moonshine at UIUC *7/17-7/21/23*

Los Angeles Workshop on Representations and Geometry at USC *6/12-6/16/23*

Richmond Geometry Meeting at VCU *6/2-6/4/23*

IHÉS Summer School in Enumerative Geometry, Physics, Representation Theory *7/2021*

SERVICE AND OUTREACH

Tutoring of probability, linear algebra, real analysis to Northwestern undergraduates 2020-2023

PREVIOUS WORK EXPERIENCE

Research Assistant, Stanford Undergraduate Research in Computer Science *2016*
Research Assistant, Stanford Undergraduate Research in Mathematics *2015*
Software Engineering Intern, xAd Inc. *2015*

MISCELLANOUS

Programming languages: Python, C++, Java, Sage

Langauges: English (native), Chinese (working proficiency)