

Yun Liu | Curriculum Vitae

Department of Mathematics – University of Iowa

✉ yun-liu@uiowa.edu • 🌐 yun2liu3.github.io

Research Interests

My research focuses on the intersection between homotopy theory, category theory and representation theory. I am working on equivariant cohomology theory for compact Lie groups, in particular GKM spaces. I am also working on trace methods of combinatorial K-theory, Quillen's model category, and models of ∞ -categories. I am also interested in formalization of mathematics and homotopy type theory.

Employment

Postdoc Research Scholar , <i>University of Iowa</i> , Iowa city, Iowa, USA	2026-
Zorn Postdoc Fellow , <i>Indiana University Bloomington</i> , Bloomington, Indiana, USA	2023-2026

Education

Ph.D. in Mathematics , <i>Cornell University</i> , Ithaca, New York, USA	2016–2023
Advisor: Yuri Berest	
Thesis: Towers of Borel Fibrations and Generalized Quasi-Invariants	
M.S. in Computer Science	2018
B.S. in Mathematics and Applied Mathematics , <i>Fudan University</i> , Shanghai, China	2011–2016
B.S. with College and University Honors	
Minor in English/Chinese Translation and Interpretation	

Publications and Preprints

Quasi-flag manifolds and Moment Graphs , <i>submitted</i> , preprint arXiv:2509.23521	2025
with Yuri Berest and Ajay C. Ramadoss	
Ganea decompositions of classifying spaces , <i>submitted</i> , preprint arXiv:2602.18682	2026
with Yuri Berest and Ajay C. Ramadoss	
Homotopy theory of Co-H-categories and Relative Hopf Comodules , <i>in preparation</i>	
with Julia Plavnik and Samarpita Ray	
Traces for Square Categories , <i>in preparation</i>	
with Sanjana Agarwal, Ramyak Bilas, and Michael Zheng	

Talks

Homology and homotopy in the world of graphs , <i>EPFL, Lausanne</i> , Contributed Talk	Sep 2026
Young Topologists Meeting , <i>University of Copenhagen</i> , Contributed Talk	Jun 2026

Tianyuan Mathematical Workshop , <i>Zhejiang University of Technology</i>	<i>May 2026</i>
Geometry and Topology Seminar , <i>University of Iowa</i>	<i>May 2026</i>
Virginia L. Chatelain Memorial Lecture , <i>Kansas State University</i>	<i>May 2026</i>
Algebra Seminar , <i>Kansas State University</i>	<i>May 2026</i>
Topology Seminar , <i>University of Rochester</i>	<i>Dec 2025</i>
QuaSy-Con III , <i>Iowa State University</i>	<i>Nov 2025</i>
Geometry and Topology Seminar , <i>University of Iowa</i>	<i>Nov 2025</i>
AMS Central Sectional Meeting , <i>Saint Louis University</i>	<i>Oct 2025</i>
AMS Southeastern Sectional Meeting , <i>Tulane University</i>	<i>Oct 2025</i>
Topology Seminar , <i>Purdue University</i>	<i>Sep 2025</i>
Workshop on Homotopy Theory , <i>The Fields Institute</i>	<i>Jul 2025</i>
Focus Program on Algebraic Topology In Memory of Fred Cohen	
Midwest Panorama of Geometry and Topology , <i>University of Iowa</i> , Early Career	<i>Jun 2025</i>
Quantum Topology and Algebra Seminar , <i>Indiana University Bloomington</i>	<i>Oct 2024</i>
Representation Theory and Related Geometry , <i>University of Georgia</i> , Contribute Talk	<i>May 2024</i>
Topology Seminar , <i>Cornell University</i>	<i>May 2024</i>
Midwest Topology Seminar , <i>Loyola University Chicago</i> , Contributed Talk	<i>Mar 2024</i>
Topology Seminar , <i>Indiana University Bloomington</i>	<i>Oct 2023</i>
Topology Seminar , <i>University of Virginia</i>	<i>May 2023</i>
Workshop on Higher Structures , <i>Penn State University</i>	<i>Dec 2022</i>

Expository Talks

Tianyuan Mathematical Workshop , <i>Zhejiang University of Technology</i>	<i>May 2026</i>
Model Categories and Homological Algebra	
Stable Homotopy Theory Reading Seminar , <i>Indiana University Bloomington</i>	<i>Apr 2026</i>
Homotopy Coherent Groups	
Quantum Topology and Algebra Seminar , <i>Indiana University Bloomington</i>	<i>Apr 2025</i>
Model Category Outside Topology	
HoMoToPIESS Student Seminar , <i>Cornell University</i>	<i>Nov 2022</i>
Classifying Space of Commutativity	
Olivetti Club , <i>Cornell University</i>	<i>Mar 2021</i>
A Brief Introduction to Noncommutative Geometry	
Topology and Geometric Group Theory Seminar , <i>Cornell University</i>	<i>Dec 2020</i>
What is Group Cohomology	
Homotopy Group Student Seminar , <i>Cornell University</i>	<i>Sep 2020</i>
Bar Constructions	
Homotopy Group Student Seminar , <i>Cornell University</i>	<i>Mar 2019</i>
Categories of Fibrant Objects	

Conferences, Seminars and Workshops Participation

Higher Categories for the Working Mathematician , Summer School Georg-August-Universität zu Göttingen, Mathematisches Institut	Jul 2026
Machine Computation in Homotopy Theory , ICERM	Jun 2026
Talbot workshop: Topological holography , Rangeley, ME	Jun 2026
Formalizing Higher Categories , Institut Mittag-Leffler, Online	Jun 2026
Atlantic Meeting on Topology, Representation theory, and K-theory University of Pennsylvania	Apr 2026
FRG workshop on higher categories and geometry , Northwestern University/NITMB	Mar 2026
Equivariant, Motivic, and Physical Topology in the Midwest University of Minnesota, Twin Cities	Oct 2025
Scissors Congruence and K-theory , University of Pennsylvania	Jul 2025
Thematic Program , University of Notre Dame Discrete Groups in Topology and Algebraic Geometry	Jun 2025
School on Univalent Mathematics , University of Minnesota, Twin Cities	Jul 2024
Formalising Algebraic Geometry , American Institute of Mathematics, Online workshop	Jun 2024
Algebraic Structures in Topology II , San Juan, Puerto Rico	Jun 2024
eCHT Hopf Rings Reading Seminar , Online	Winter 2024
Midwest Topology Seminar , University of Illinois, Urbana-Champaign	2023
Mid-Atlantic Topology Conference , University of Pennsylvania	2023
Derived Categories and Moduli Spaces , Cornell University	2022
Supergeometry and Bracket Structures in Mathematics and Physics , The Fields Institute	2022
Hypergeometry, Integrability and Lie Theory , Lorentz Center, Online Workshop	2020
Higher Categories and Categorification , MSRI, Introductory Workshop	2020
Higher Categories and Categorification , MSRI, Connections for Women Workshop	2020
Derived Algebraic Geometry IMT-SCU , Sichuan University, Annual Program	2019
New Trends in Geometry and Mathematical Physics , Congressi Stefano Franscini, ETH	2019
Modern Trends in Non-Commutative Geometry , Northwestern University	2019
Derived Geometry and Higher Categorical Structures in Geometry and Physics Séminaire de Mathématiques Supérieures, The Fields Institute	2018
Topology Festival , Cornell University	2017-2025

Seminars (Co)-organized

Reading Seminar , Co-organizer, Indiana University Bloomington Stable Homotopy Theory	Spring 2026
---	-------------

AWM Speaker Series , <i>Co-organizer</i> , Indiana University Bloomington	2026
Olivetti Club , <i>Organizer</i> , Cornell University	2018
What is Seminar , <i>Organizer</i> , Cornell University	2017

Mentor

Research Experiences for Undergraduate , <i>Indiana University Bloomington</i> , Mentor	Summer 2025
Project: Computing HH_0 for Polytopes in $\mathbb{R}^2$	
Directed Reading Program , <i>Cornell University</i> , Mentor	2020–2022
Topics: Category Theory, Model Categories and Higher Categories	

Teaching

Instructor	
MATH2850 Vector Calculus , <i>University of Iowa</i>	Fall 2026
MATH-M120 Brief Survey of Calculus 2 , <i>Indiana University Bloomington</i>	Spring 2026
MATH-M330 Exploring Mathematical Ideas , <i>Indiana University Bloomington</i>	Fall 2025
MATH-M321 Intuitive Topology , <i>Indiana University Bloomington</i>	Spring 2025
MATH-M301 Linear Algebra and Applications , <i>Indiana University Bloomington</i>	Spring 2024
MATH-M211 Calculus I , <i>Indiana University Bloomington</i>	Fall 2023, 2024
MATH1110 Calculus I , <i>Cornell University</i> , Online	Spring 2021

Honors and Awards

Department of Mathematics Teaching Award , <i>Cornell University</i>	2022
Cornell University Fellowship , <i>Cornell University</i>	2016–2017
Outstanding Undergraduates in Shanghai , <i>Fudan University</i>	2016
Honored Student , <i>Fudan University</i> , Program of Top Talented Students in Mathematics	2016
Tencent First Class Scholarship for Outstanding Undergraduates , <i>Fudan University</i>	2016
Xiangqian Scholarship for Exchange Students , <i>Fudan University</i>	2014

Service and Outreach

Sonia Kovalevsky Day , <i>Indiana University Bloomington</i> , Co-organizer	Feb 2026
Science Fest , <i>Indiana University Bloomington</i> , Co-organizer	Nov 2025
Julia Robinson Festival , <i>Indiana University Bloomington</i> , Volunteer	Apr 2025
Sprouts Math Circle , <i>Indiana University Bloomington</i> , Volunteer	2025
AWM Chapter , <i>Indiana University Bloomington</i> , Outreach Coordinator	2025
Math Club , <i>Indiana University Bloomington</i> , Talk	Oct 2023
Mathematics TA Training Workshop , <i>Cornell University</i> , Facilitator	2022
Active Learning Initiative , <i>Cornell University</i> , Facilitator	2022