Shiyue Li 李詩樂

Donald J. Lewis Research Assistant Professor (non-tenure-track) shiyueli@umich.edu
Department of Mathematics, University of Michigan www.shiyue.li

Research interests: algebraic geometry, combinatorics, tropical geometry.

Employment

University of Michigan, Ann Arbor, MI 2025–present
Donald J. Lewis Research Assistant Professor (non-tenure-track)
Mentor: David Speyer

Institute for Advanced Study, Princeton, NJ 2024–2025
Member, School of Mathematics
Mentors: Federico Ardila-Mantilla and June Huh

Institute for Advanced Study, Princeton, NJ 2023–2024
Member, School of Mathematics
Mentors: June Huh and Jacob Lurie

Education

Brown University, Providence, RI 2019–2023
Ph.D. and M.Sc. in Mathematics
Advisor: Melody Chan
Thesis: K-rings and Hodge structures in graphs, matroids, and moduli spaces of curves

Yale University, New Haven, CT 2017–2019
M.Sc. in Mathematics
Lang Fellow

Harvey Mudd College, Claremont, CA 2013–2017
B.Sc. in Mathematics with Honors and Distinction
Advisor: Dagan Karp
Thesis: Chow rings of heavy/light Hassett spaces via tropical geometry

Preprints and Publications

16 **Chow polynomials and chain polynomials of matroids are not log-concave**
with Gergely Bérczi, Basile Coron, and Christopher Eur, with substantial assistance by LLMs
arXiv:2610.17135

15 **Magic positivity of Snapper polynomials for matroids**
arXiv:2609.24917

14 **Matroid analogues of Gal's conjecture**
with Basile Coron and Luis Ferroni
arXiv:2604.04550

13 **Structural properties of nested set complexes**
with Basile Coron and Luis Ferroni
arXiv:2601.05188

12 **Chow polynomials of rank-uniform labeled posets**
with Basile Coron and Luis Ferroni
arXiv:2511.13819

11 **Kapranov degrees**
with Joshua Brakensiek, Christopher Eur, and Matt Larson
International Mathematics Research Notices (2025)

10 **Multimatroids and rational curves with cyclic action**
with Emily Clader, Chiara Damiolini, Christopher Eur, and Daoji Huang
International Mathematics Research Notices (2024)

9 **Equivariant log-concavity of independence sequences of claw-free graphs**
Séminaire Lotharingien de Combinatoire 89B (2023)

8 **K-rings of wonderful varieties and matroids**
with Matt Larson, Sam Payne, and Nicholas Proudfoot
Advances in Mathematics 441 (2024)

7 **Wonderful compactifications and rational curves with cyclic action**
with Emily Clader, Chiara Damiolini, and Rohini Ramadas
Forum of Mathematics, Sigma 11 (2023)

6 **Equivariant log-concavity of graph matchings**
Algebraic Combinatorics 6 (2023)

5 **Relative Bott–Samelson varieties**
La Matematica 2 (2023)

4 **Topology of tropical moduli spaces of weighted stable curves in higher genus**
with Siddarth Kannan, Stefano Serpente, and Claudia He Yun
Advances in Geometry 23 (2023)

3 **Permutohedral complexes and rational curves with cyclic action**
with Emily Clader, Chiara Damiolini, Daoji Huang, and Rohini Ramadas
manuscripta mathematica (2022)

2 **Intersecting psi-classes on tropical Hassett spaces**
with Marvin Anas Hahn
Combinatorial Theory 2 (2022)

1 Chow ring of heavy/light Hassett spaces via tropical geometry
with Siddarth Kannan and Dagan Karp
Journal of Combinatorial Theory, Series A 178 (2021)

Fellowships, Grants and Awards

NSF Grant DMS-1926686, Institute for Advanced Study	2023–2025
Coline M. Makepeace Fellowship, Brown University	2021–2022
Robert Willets Carle Scholarship, Yale University	2018–2019
Lang Fellowship, Department of Mathematics, Yale University	2017–2019
Kenneth and Mary Wang Fellowship, Yale University	2017–2018
Harvey S. Mudd Merit Award (annually), Harvey Mudd College	2013–2017
Yu Yuen Kit So International Scholarship, Harvey Mudd College	2013–2017
Dean's List (all semesters), Harvey Mudd College	2013–2017
China National Linguistics Olympiad, 3rd Place	2013
China National Linguistics Olympiad, Team 2nd Place	2013

Invited Talks

Universität Bielefeld LG&TBQ 2027	Aug 2027
Casa Matemática Oaxaca (BIRS–CMO) Collaborative Workshop for Women and Gender-Expansive Individuals in Algebraic Geometry (WIAG 3)	Jul 2027
Joint Mathematics Meetings, Chicago AWM Special Session: Women in Algebraic Geometry	Jan 2027
Mathematisches Forschungsinstitut Oberwolfach Mini-Workshop: Enumerative Geometry of Matroids	Dec 2026
University of Illinois Urbana-Champaign ALGECOM-XXVIII	Nov 2026
University of Michigan Combinatorics Seminar	Sep 2026
Casa Matemática Oaxaca (BIRS–CMO) Algebra and Geometry of Matroids	Sep 2026
Università di Pisa Algebraic Combinatorics in Pisa	Jun 2026

Université du Québec à Montréal May 2026
Mini-courses on Geometry and Combinatorics of Moduli Spaces

University of Michigan Apr 2026
Algebraic Geometry Seminar

Boston College Mar 2026
AMS Sectional Meeting, Special Session on Geometry of Moduli Spaces

University of Pennsylvania Apr 2025
Algebraic Geometry Seminar

Joint Mathematics Meetings, Seattle Jan 2025
AMS Special Session on Cohomology of Arithmetic Groups, Mapping Class Groups, and Moduli Spaces

Institute for Advanced Study Oct 2024
Geometry of Matroids Workshop

Institute for Advanced Study Oct 2024
"What is...?" Seminar

Institute for Advanced Study Sep 2024
Short Talks by Postdoctoral Members

ETH Zurich Sep 2024
Moduli spaces of curves, moduli spaces of graphs and graph complexes

Banff International Research Station Jul 2024
Combinatorics and Geometry of Moduli Spaces of Curves

Suzhou University 蘇州大學 Jul 2024
Suzhou Workshop on Matroid Theory

Mathematisches Forschungsinstitut Oberwolfach Jun 2024
Arrangements, Matroids and Logarithmic Vector Fields

Columbia University Apr 2024
Algebraic Geometry Seminar

Tufts University Apr 2024
Algebra Seminar

Institute for Advanced Study Mar 2024
Mathematical Conversations

Institute for Advanced Study Mar 2024
"What is...?" Seminar

University of Minnesota Feb 2024
Combinatorics Seminar

Joint Mathematics Meetings, San Francisco Jan 2024
AMS Special Session on Combinatorial Perspectives on Algebraic Curves and their Moduli

Online Jan 2024
F_1 World Seminar

Max-Planck-Institut für Mathematik in den Naturwissenschaften, Leipzig Oct 2023
Preparatory lectures for the Chow Lectures

Institute for Advanced Study Sep 2023
Short Talks by Postdoctoral Members

École polytechnique fédérale de Lausanne Sep 2023
Bernoulli Center Workshop: Hodge and K-Theory Meet Combinatorics

Banff International Research Station Aug 2023
Curves: Algebraic, Tropical, and Logarithmic

University of California, Davis Jul 2023
FPSAC 2023

Brown University Jul 2023
AGNES Summer School on Intersection Theory of Moduli Spaces

American Institute of Mathematics Mar 2023
GEMS in Combinatorics Workshop

Banff International Research Station Mar 2023
Algebraic Aspects of Matroids

Bowdoin College Feb 2023
Growing Up in Science

University of Pittsburgh Feb 2023
AWM Student Seminar Series

University of Michigan Feb 2023
Combinatorics Seminar

Fields Institute Dec 2022
Matroids Seminar (online)

University of Washington Nov 2022
Algebra and Algebraic Geometry Seminar

Harvard University Nov 2022
Harvard–MIT Combinatorics Seminar

University of Massachusetts Amherst Oct 2022
AMS Special Session on Combinatorial Algebraic Geometry

University of Minnesota Jun 2022
AWM Research Symposium

University of Oregon Jun 2022
RATCOW

Brown University May 2022
BATMOBYLE

Joint Mathematics Meetings Apr 2022
AWM Special Session (online)

Brown University Apr 2022
Combinatorial and Nonlinear Day

Canadian Mathematical Society Winter Meeting Dec 2021
Session on Combinatorics and Geometry of Moduli Spaces

Colorado State University Sep 2021
Front Range Algebraic Geometry and Number Theory Seminar

SIAM Aug 2021
Conference on Applied Algebraic Geometry (AG21)

Online Apr 2021
Moduli Across the Pandemic

Goethe-Universität Frankfurt Apr 2021
Tropical Geometry in Frankfurt (TGiF) Seminar

Online Mar 2021
AMS Spring Eastern Sectional Meeting, Special Session on Moduli of Curves, Hilbert Schemes, and Tropical Geometry

Brown University Nov 2020
Algebra Seminar

Online Oct 2020
American Graduate Student Algebraic Geometry Seminar

Service

Referee

Advances in Mathematics† (×2)

Algebraic Combinatorics (×2)

Duke Mathematical Journal

European Journal of Combinatorics

Forum of Mathematics, Sigma (×2)

International Mathematics Research Notices (×4)

Journal für die reine und angewandte Mathematik (Crelle's Journal)*

Journal of the London Mathematical Society (×3)

Mathematische Zeitschrift†

Proceedings of the American Mathematical Society (×2)

Proceedings of the London Mathematical Society

Séminaire Lotharingien de Combinatoire (FPSAC)† (×3)

*Quick opinions only. †Quick opinion and/or detailed report.

Organization

University of Michigan, Combinatorics Lunch 2025–present
Co-organizer

University of Michigan, AWM Advisory Board 2025–2026

Institute for Advanced Study, Graph Complexes Learning Seminar Fall 2024
Organizer

Institute for Advanced Study, “What is...?” Seminar 2023–2025
Co-organizer

Institute for Advanced Study, School of Mathematics Women’s Lunch (monthly) 2023–2025
Co-organizer

Brown University, AMS Student Chapter 2019–2021
Chair

Brown University, Directed Reading Program 2019–2021
Organizer

Brown University, Diversity and Inclusiveness Committee 2019–2020
Member

Yale University, Intersection: Womxn in Mathematics 2018
Co-organizer

Yale University, Directed Reading Program 2017–2018
Co-organizer with Fernando Al Assal

Yale University, Graduate and Professional Student Senate 2017–2018
Senator

Harvey Mudd College, Math Club 2016–2017
President

Teaching

University of Michigan, instructor

Math 565, Combinatorics and Graph Theory (graduate) Fall 2026

Math 566, Combinatorial Theory (graduate) Winter 2026

Math 275, Introduction to Cryptography (inquiry-based learning) Fall 2025

Brown University, teaching assistant

Math 90, Introduction to Calculus Spring 2023

Math 100, Calculus Part II 2020–2022
Fall 2020, Spring 2021, Spring 2022, Fall 2022

Sheridan Teaching Certificate I Fall 2021

Canada/USA Mathcamp, mentor

Introduction to Group Theory	Summer 2019
Young Tableaux and Representation Theory	
Young Tableaux and Combinatorics	
Young Tableaux and Probability	
Algebraic Number Theory	Summer 2018
Geometric Group Theory	
Introduction to Modular Forms	
Tropical Plane Curves	
Rational Points on Elliptic Curves	

Yale University, teaching assistant

Math 225, Linear Algebra and Matrix Theory	Fall 2018
Math 112, Single Variable Calculus	Spring 2018

Mentoring

Women in Algebraic Geometry, Collaborative Workshop, Casa Matemática Oaxaca — Jul 2027
Co-mentor: Chiara Damiolini
Project: Symmetric functions and conformal blocks on $\overline{\mathcal{M}}_{g,n}$

Independent study, University of Michigan — Fall 2026
Edward (Weizhen) Tong
Co-mentor: Bailee Zacovic
Project: Chow functions of unbounded posets

Reading course, University of Michigan — Summer 2026
Yijie Guo and Kate Krotkov
Co-mentor: Sam Payne
Topic: Introduction to toric varieties

Summer Undergraduate Math Research at Yale (SUMRY) — Summer 2020
Dawit Mengesha, Robert Miranda, and Brian Sun
Co-mentor: Max Kutler
Project: Topological zeta functions of matroids (arXiv:2605.07077)

Learning projects, Canada/USA Mathcamp — Summer 2019
Alice Jenkins and Jeremy Zhou: Schubert calculus
Reed Jacobs: Primes of the form $x^2 + ny^2$
Simran Khunger and Rupert Li: Enumerative geometry and Young tableaux
Serena An: Group actions and Sylow's theorems
Ilaria Seidel

Directed Reading Program, Brown University 2019
Deven Carmichael and Joseph Hlavinka: Ideals, Varieties, and Algorithms
Dominick Joo, Elliott Lehrer, and Joshua Lebo: Foundations of Algebraic Geometry

Women in Sciences at Yale 2018
Alara Değirmenci

Outreach

Princeton University Apr 2024
Noetherian Rings Seminar

Brown University Apr 2023
Math Slam

Bowdoin College Feb 2023
Growing Up in Science lecture series

Yale University Jul 2020
SUMRY Colloquium

Yale University Nov 2019
Yale Undergraduate Mathematics Society (YUMS) Colloquium

Brown University Oct 2019
Department Undergraduate Group (DUG) Colloquium

Other Research Positions

Google Research, Mountain View, CA Summer 2016
Research intern
Mentors: Caroline Pantofaru and Malcolm Slaney

Howard Hughes Medical Institute, Pomona, CA Summer 2014
Research assistant
Mentor: Blerta Shtylla

Summer Science Program, Socorro, NM Summer 2012
Orbit determination of asteroid 1998 QS52
Archived by the Harvard–Smithsonian Center for Astrophysics