

MENGWEI HU

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EDUCATION

Ph.D. in Mathematics, Yale University *2020 - 2026*

Advisor: Prof. Ivan Losev

B.Sc. (Honor) in Mathematics, Sichuan University *2016 - 2020*

INTERESTS

Geometric representation theory, specifically on symmetric pairs and nilpotent orbits, Nakajima quiver varieties, deformation quantizations and Harish-Chandra (\mathfrak{g}, K) -modules.

RESEARCH

- *On certain Lagrangian subvarieties in minimal resolutions of Kleinian singularities.* Submitted.
arXiv:2504.08717
- *Presentations of diagram categories.* PUMP J. Undergrad. Res., 3:1-25, 2020.

TALKS AND PRESENTATIONS

Seminar Talks

- Algebra Seminar, University at Buffalo *Sep 2025*
- GPRT Seminar, Northeastern University *Fall 2025**
- Topology Seminar, Johns Hopkins University *Fall 2025**
- Algebra Seminar, University of Georgia *Fall 2025**
- Algebra Seminar, Syracuse University *Fall 2025**
- Algebra Seminar, University of Oregon *Mar 2025*
- Algebra Seminar, UCLA *Mar 2025*
- Geometry, Symmetry and Physics Seminar, Yale *Jan 2025*

Conference Talks

- AWM Research Symposium Special Session, UW-Madison *May 2025*
- Southeastern Lie Theory Workshop XV, College of Charleston *May 2025*
- AMS Fall Western Sectional Meeting Special Session, UCR *Oct 2024*
- AMS Fall Eastern Sectional Meeting Special Session, UAlbany *Oct 2024*

Poster and Short Talks

- Categorification and Symplectic Duality Workshop, NEU (presented a poster) *Jun 2025*
- Women in Mathematics in New England, Smith College (15-min student talk) *Sep 2024*
- Representation Theory and Related Geometry: Progress and Prospects, UGA (12-min talk) *May 2024*
- MSRI New Directions in Representation Theory, Hawaii (3-min participant talk) *Jun 2022*

TEACHING AND MENTORING

At Yale University

- REU Co-mentor: Superalgebras and Polynomial Spaces *Summer 2025*

- Instructor: Multivariable Calculus and Linear Algebra for Econ, Syllabus Summer 2024
- Graduate Instructor: Calculus I, II Fall 2022, 2023, 2024, Spring 2026
- Teaching Assistant: Linear Algebra, Calculus Spring, Summer, Fall 2021, Summer 2023

EXPOSITORY TALKS

- Kleinian singularities and Nakajima quiver varieties, I-III, *Yale Topics in Rep Theory* Nov 2024
- Anti-Poisson involutions of Kleinian singularities, *Yale Graduate Student Seminar* Oct 2024
- Derived Koszul duality, I-III, *Yale Koszul Duality Reading Group* Mar 2024
- The six functors, I-III, *Yale Learning Seminar on D-modules* Oct-Nov 2023
- Harish-Chandra bimodules over quantum algebras, I-II *Yale W-algebras Reading Group* Mar 2023
- Borel-Moore homology I-II, *Joint Yale-Columbia Representation Seminar* Sep 2022
- Schur-Weyl duality and its generalizations, *Yale Graduate Student Seminar* Feb 2022
- Derived categories and derived functors, I-II. *Yale Perverse Sheaf Reading Group* Oct 2021

VISITS

- Shanghai Center for Mathematical Sciences, Research Assistant 09/2020-06/2021
- MIT, Visiting Student, *Supervisor: Prof. Zhiwei Yun* 01/2020-03/2020
- UOttawa, Visiting Student Researcher, *Supervisor: Prof. Alistair Savage* 07/2019-10/2019
- HKUST, Visiting Internship Student, *Supervisor: Prof. Jingsong Huang* 07/2019-08/2019
- Peking University, Exchange Student 09/2018-01/2019

AWARDS

- Fan Family Fellowship Endowment, *awarded by Yale University* 2020
- China National Scholarship, *awarded by the Ministry of Education of China* 2017, 2019
- Gold Medal in Chinese Mathematics Competition for College Students 2019

SERVICES AND OUTREACH

- Women in Mathematics in New England, *Graduate School Panelist* Sep 2024
- Lang Teaching Seminar at Yale, *Graduate Instructor Panelist* Mar 2024
- Yale Graduate Student Advisory Committee, *Cohort Representative* 2023 - present
- Certificate of College Mathematics Teaching Preparation, *In Preparation* 2023 - present
- Joint Yale-Columbia Representation Seminar, *Co-organizer* Fall 2022
- Yale Graduate Student Seminar, *Co-organizer* Spring 2022
- Yale Take an Undergraduate to School, *Mentor* Spring 2022

CONFERENCES ATTENDED

- Workshop on Cluster Algebras and Braid Varieties, UO Aug 2025
- 7th Canada-USA-Mexico Meeting, USC Jul 2025
- Representation Theory Days, MIT Nov 2024
- Poisson Gone Fishing 2024, Northwestern University, Apr 2024
- Summer School on Coulomb Branches and Knot Homology, MIT Jun 2023
- Summer School on Quantized Symplectic Singularities and Applications to Lie Theory, MIT Jun 2022
- 4th Canada-USA-Mexico Meeting, NEU Jun 2022
- From Representation Theory to Mathematical Physics and Back, SCGP Jun 2022
- On the Crossroads of Algebra, Geometry and Physics, Yale May 2022