

# MENGWEI HU

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## EDUCATION

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

Advisor: Prof. Ivan Losev

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

## INTERESTS

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

## RESEARCH

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- *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

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### Seminar Talks

- Algebra Seminar, Syracuse University Fall 2025\*
- Algebra Seminar, University of Georgia 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

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### 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

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

## VISITS

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

## AWARDS

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| · Fan Family Fellowship Endowment, <i>awarded by Yale University</i>               | 2020       |
| · China National Scholarship, <i>awarded by the Ministry of Education of China</i> | 2017, 2019 |
| · Gold Medal in Chinese Mathematics Competition for College Students               | 2019       |

## SERVICES AND OUTREACH

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

## CONFERENCES ATTENDED

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| · 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 |