

# Mengwei Hu

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## Education

- 2020 – 2026 **Ph.D. in Mathematics**, Yale University.  
◦ Advisor: Prof. Ivan Loseu.
- 2016 – 2020 **B. Sc. (Honor) in Mathematics**, Sichuan University.  
◦ GPA: 93.24/100, Rank: 1/206.

## Research Interests

Geometric representation theory, specifically on Harish-Chandra modules, deformation quantizations, quantum mechanical systems, and Nakajima quiver varieties.

## Publications

- [1] M. Hu. On certain Lagrangian subvarieties in minimal resolutions of Kleinian singularities, *coming soon*.
- [2] M. Hu. Presentations of diagram categories. *PUMP J. Undergrad. Res.*, 3:1-25, 2020.

## Research Talks

- TBD Algebra Seminar, Syracuse University
- May 2025 AWM Research Symposium, UW Madison
- Mar 2025 Algebra Seminar, UOregon
- Mar 2025 Algebra Seminar, UCLA
- Jan 2025 Geometry, Symmetry and Physics Seminar, Yale
- Oct 2024 AMS Fall Western Sectional Meeting, UC Riverside
- Oct 2024 AMS Fall Eastern Sectional Meeting, UAlbany
- Sep 2024 Women in Mathematics in New England, Smith College
- May 2024 Representation Theory and Related Geometry: Progress and Prospects, UGA

## Current Projects

- 01/2023-present **Lagrangian subvarieties in minimal resolutions of Kleinian singularities**  
This project studies anti-Poisson involutions and their fixed loci on *ADE* singularities, which appear naturally in the classification of irreducible Harish-Chandra  $(\mathfrak{g}, K)$ -modules.  
◦ *This project is under final revision for submission.*

- 11/2024-present **Anti-Poisson involutions on deformations of Kleinian singularities**  
This is a continuation of the above project. We lift the anti-Poisson involutions to the semi-universal deformations of *ADE* singularities as well as their minimal resolutions.
- 05/2023-present **Codimension 2 singularities in the nilpotent variety of symmetric spaces**  
The codimension 1 singularities in the nilpotent variety of the symmetric spaces are the singular Lagrangian subvarieties mentioned in the first project. This project aims to classify the codimension 2 singularities in the nilpotent variety of the symmetric spaces, up to smooth equivalence.

## Teaching and Mentoring

### REU Mentor

- Summer 2025 Project: Superalgebras and Polynomial Spaces, Co-Mentor, [SUMRY 2025](#).

### Instructor of Record

- Summer 2024 MATH S118E: Multivariable Calculus and Linear Algebra for Econ, [Syllabus](#).  
Fall 2024 MATH 115: Calculus II  
Fall 2022, 2023 MATH 112: Calculus I

### Teaching Assistant

- Summer 2023 MATH S120E: Calculus III  
Fall 2021 MATH 225: Linear Algebra  
Summer 2021 MATH S222: Linear Algebra with Applications  
Spring 2021 MATH 112: Calculus I

### Additional Pedagogical Training

- May 2026 Certificate of College Mathematics Teaching Preparation Program, *offered jointly by the Yale Math Department and the Poorvu Center for Teaching and Learning*

## Expository Talks

- Nov 2024 Kleinian singularities and Nakajima quiver varieties, *Seminar by Prof. Igor Frenkel*.  
Oct 2024 Anti-Poisson Involutions of Kleinian Singularities, *Graduate student seminar at Yale*.  
Mar 2024 Derived Koszul duality, *Koszul duality reading group at Yale*.  
Oct-Nov 2023 The six functors, [Learning seminar on D-modules](#), organized by Prof. Ivan Losev.  
Mar 2023 Harish-Chandra bimodules over quantum algebras, *W-algebras reading group at Yale*.  
Sep 2022 Borel-Moore homology, [Joint Yale-Columbia representation seminar](#).  
Jun 2022 Semisimple Lie algebras and nilpotent orbits, *MSRI summer school*.  
Feb 2022 Schur-Weyl duality and its generalizations, *Graduate student seminar at Yale*.  
Oct 2021 Derived categories and derived functors. *Perverse sheaf reading group at Yale*.

## Academic Visits

- 09/2020-06/2021 Fudan University, Visiting Student, *Algebraic Geometry Group*.

07/2020-08/2020 Sichuan University, Research Assistant. *Advisor: Prof. Xiaojun Chen.*  
 01/2020-03/2020 MIT, Visiting Student. *Advisor: Prof. Zhiwei Yun.*  
 07/2019-10/2019 University of Ottawa, Visiting Student Researcher. *Advisor: Prof. Alistair Savage.*  
 07/2019-08/2019 HKUST, Visiting Internship Student. *Advisor: Prof. Jingsong Huang.*  
 09/2018-01/2019 Peking University, Exchange Student.

## Selected Awards

2020 Fan Family Fellowship Endowment, *awarded by Yale University.*  
 2017 & 2019 China National Scholarship, *awarded by the Ministry of Education of China.*  
 2019 Mitacs Globalink Research Internship Award, *awarded by Mitacs Organization.*  
 2019 Gold Medal in the Tenth Chinese Mathematical Contest for College Students, *awarded by Chinese Mathematical Association.*

## Service and Outreach

Sep 2024 **Panelist** for Graduate School Panel at [Women in Math in New England 2024](#).  
 Mar 2024 **Panelist** for Graduate Student Instructor Panel at Yale Lang Seminar.  
 2023-present **Representative** of Graduate Student Advisory Committee (GSAC) at Yale.  
 Fall 2022 **Co-organizer** of [Yale-Columbia Joint representation seminar](#).  
 Spring 2022 **Co-organizer** of Graduate Student Seminar at Yale.  
 Spring 2022 **Mentor** of Take an Undergraduate to School Program at Yale, .

## Miscellaneous

- Languages: English (proficient), Mandarin (native), French (beginner).
- Hobbies: Basketball and Jigsaw Puzzles.