

Yunfan He

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Work

Postdoctoral Fellow

Beijing International Center for Mathematical Research

Sep 2024 - Present

Mentor: Bohan Fang

Education

Ph.D. Mathematics

University of Wisconsin-Madison

2018 – 2024

Advisor: Andrei Căldăraru

M.A. Mathematics

University of Wisconsin-Madison

2016 – 2018

B.S. Mathematics and Applied Mathematics

Shanghai Jiao Tong University

2013 – 2017

Experience

Graduate Student Teaching Assistant

University of Wisconsin-Madison

Aug 2018 – May 2024

Awards, Honors and Grants

The Excellence in Research Graduate Student Awards

University of Wisconsin-Madison

2023, 2024

Summer Research Fellowship

University of Wisconsin-Madison

2020, 2021, 2023

Outstanding TA Award

University of Wisconsin-Madison

2020

Publications and Preprints

- [1] Andrei Caldararu and Yunfan He. *Holomorphic anomaly equation for categorical enumerative invariants of elliptic curves*. (in preparation).
- [2] Andrei Caldararu, Yunfan He, and Weng-Him Cheung. *$g=2$ categorical enumerative invariants for elliptic curves*. (in preparation).
- [3] Andrei Caldararu, Yunfan He, and Shengyuan Huang. *Moonshine at Landau-Ginzberg points*. arXiv: 2107.12405. (accepted by Proceedings of the AMS).
- [4] Yunfan He. "Categorical Enumerative Invariants of Elliptic Curves". PhD thesis. The University of Wisconsin-Madison, 2024.
- [5] Yunfan He. *Hodge to de Rham degeneration of curves with local complete intersection singularities*. (submitted).
- [6] Yunfan He. *Hodge to de Rham degeneration of nodal curves*. 2025. arXiv: 2311.08477. (accepted by Transactions of the AMS).

Conference Talks

HAE for CEI of elliptic curves is “easy”.

Simons Center for Geometry and Physics

Recent developments in higher genus curve counting

February 2025

HAE for categorical enumerative invariants of elliptic curves.

University of Arizona

Commutative Algebra and Algebraic Geometry in TUCSon

May 2024

HAE for categorical enumerative invariants of elliptic curves.

University of Oregon

Workshop on Enumerative Geometry and related topics

April 2024

Seminar Talks

HAE for categorical enumerative invariants of elliptic curves.

Peking University

Postdoc Seminar

Fall 2024

Hodge to de Rham degeneration of nodal cubic curve.

Simons Laufer Mathematical Sciences Institute

COMA/NAG Graduate Student Seminar

Spring 2024

Variation of Hodge structures.

University of Wisconsin-Madison

Graduate Algebraic Geometry Seminar

Spring 2023

Introduction to mixed Hodge structures and mixed Hodge modules.

University of Wisconsin-Madison

Graduate Algebraic Geometry Seminar

Fall 2020

Braid group action on derived categories.

University of Wisconsin-Madison

Graduate Algebraic Geometry Seminar

Spring 2020

Finite common covering of graphs.

Shanghai Jiao Tong University

Combinatorics Seminar

Summer 2016

Conferences and Workshops

2025 International Congress of Basic Science

Beijing Institute of Mathematical Sciences and Applications

Participant

July 2025

String-Math 2025

Beijing Institute of Mathematical Sciences and Applications

Participant

June 2025

Recent developments in higher genus curve counting

Simons Center for Geometry and Physics

Speaker

February 2025

Topological Strings on Calabi-Yau Manifolds - Math and Physics

Beijing International Center for Mathematical Research

Participant

September 2024

Commutative Algebra and Algebraic Geometry in TUCSon. <i>University of Arizona</i> Speaker	May 2024
Workshop on Enumerative Geometry and related topics <i>University of Oregon</i> Speaker	April 2024
Recent Developments in Noncommutative Algebraic Geometry <i>Simons Laufer Mathematical Sciences Institute</i> Participant	April 2024
Introductory Workshop: Noncommutative Algebraic Geometry <i>Simons Laufer Mathematical Sciences Institute</i> Participant	February 2024
Connections Workshop: Noncommutative Algebraic Geometry <i>Simons Laufer Mathematical Sciences Institute</i> Participant	February 2024
FRG workshop on Brauer groups and derived categories <i>Northwestern University</i> Participant	October 2023
Algebraic Geometry Northeastern Section <i>University of Pennsylvania</i> 5 mins talk speaker	October 2023
FRG preprint seminar <i>Northwestern University</i> Participant	August 2023
Algebraic geometry and cohomology in mixed characteristic <i>Northwestern University</i> Participant	May 2023
Midwest Algebraic Geometry Graduate Conference <i>University of Illinois-Chicago</i> Participant	August 2022
Derived FRG: Derived Categories, Moduli Spaces, and Hyperkähler Varieties <i>University of Michigan-Ann Arbor</i> Participant	August 2022
Algebraic Geometry Northeastern Series <i>Rutgers University(online)</i> Participant	May 2022
On the crossroads of algebra, geometry and physics - Dedicated to A. Goncharov <i>Yale University</i> Participant	March 2022
Algebraic Geometry Northeastern Series <i>Boston College(online)</i> Participant	October 2021
Madison Moduli Weekend <i>University of Wisconsin-Madison(online)</i> Participant	September 2020

Midwest Algebraic Geometry Graduate Conference*University of Illinois-Chicago(online)**May 2020*

Participant

Groups and Graphs, Designs and Dynamics(G2D2)*Three Gorges Mathematical Research Center**August 2019*

Participant

Midwest Algebraic Geometry Graduate Conference*University of Illinois-Chicago**March 2019*

Participant

I-70 Algebraic Geometry Symposium*University of Missouri-St. Louis**October 2018*

Participant

Teaching

Lecturer Student Assistant at University of Wisconsin-Madison.....

- **Math 112: College Algebra** (*Instructor*) *Fall 2023*

Graduate Student Teaching Assistant at University of Wisconsin-Madison.....

- **Math 321: Applied Mathematical Analysis** (*TA*) *Spring 2023*
- **Math 234: Calculus III** (*TA*) *Fall 2022*
- **Math 240: Introduction to Discrete Mathematics** (*TA*) *Summer 2022*
- **Math 340: Matrix and Linear Algebra** (*TA*) *Spring 2022*
- **Math 320: Linear Algebra and Differential Equations** (*TA*) *Fall 2021*
- **Math 234: Calculus III** (*TA*) *Spring 2021*
- **Math 320: Linear Algebra and Differential Equations** (*TA*) *Spring 2020-Fall 2020*
- **Math 112: College Algebra** (*TA*) *Fall 2019*
- **Math 222: Calculus II** (*TA*) *Spring 2019*
- **Math 221: Calculus I** (*TA*) *Fall 2018*

Outreach and Service

Graduate Student Mentor*University of Wisconsin-Madison**Spring 2018*

Directed Reading Program

Volunteered Tutor*Shanghai Jiao Tong University**Aug 2014*

Volunteer Tutor Program