# Zengrui Han

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University of Maryland, College Park
College Park, MD 20742

## APPOINTMENTS

2025–2028    University of Maryland, College Park
  Brin Postdoctoral Fellow

2020–2021    University of Science and Technology of China
  Research Assistant

## EDUCATION

Ph.D.    Rutgers, the State University of New Jersey,    2020-2025
  Advisor: Lev Borisov
  Dissertation: GKZ hypergeometric systems and toric mirror symmetry

B.S.    University of Science and Technology of China,    2016-2020

## RESEARCH AREAS

Algebraic Geometry, especially mirror symmetry and related areas.

## PUBLICATIONS AND PREPRINTS

2025    Hanlon-Hicks-Lazarev resolution revisited, with Lev Borisov. arXiv:2509.11077.

2025    GKZ hypergeometric systems and toric mirror symmetry. Ph.D. Thesis.

2024    Stringy Hodge numbers of Pfaffian double mirrors and Homological Projective Duality. arXiv:2409.17449. Submitted.

2024    Central charges in local mirror symmetry via hypergeometric duality. **Advances in Mathematics**, Volume 480, Part B (2025): 110502. arXiv:2404.16258.

2023    Analytic continuation of better-behaved GKZ systems and Fourier-Mukai transforms, **Épijournal de Géométrie Algébrique**, Volume 9 (2025), Article no. 11. arXiv:2305.12241

2023    On hypergeometric duality conjecture, with Lev Borisov, **Advances in Mathematics**, Volume 442 (2024): 109582. arXiv:2301.01374

2019    On duality of certain GKZ hypergeometric systems, with Lev Borisov and Chengxi Wang, **Asian Journal of Mathematics**, Volume 25 (2021), No.1, 65-88. arXiv:1910.04039

## TALKS AND PRESENTATIONS

2025    "Resolution of toric subvarieties by line bundles revisited", JHU-UMD Algebra and Number Theory Day, University of Maryland, Nov 2025.

| 2025 | "GKZ hypergeometric systems and toric mirror symmetry", mini-talk, Georgia Algebraic Geometry Symposium, Mar 2025 |
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| 2025 | "GKZ hypergeometric systems and toric mirror symmetry", Syzygies and Mirror Symmetry Virtual Seminar, Feb 2025. |
| 2024 | "Stringy Hodge numbers of Pfaffian double mirrors and Homological Projective Duality", poster, Western Algebraic Geometry Symposium, University of Arizona, Nov 2024. |
| 2024 | "Stringy Hodge numbers of Pfaffian double mirrors and Homological Projective Duality", 5-min talk, Algebraic Geometry Northeastern Series, Dartmouth College, Nov 2024. |
| 2024 | "GKZ systems and their applications to toric mirror symmetry", poster, Algebraic Geometry Northeastern Series, Dartmouth College, Nov 2024. |
| 2024 | "Pfaffian double mirrors, stringy Hodge numbers and Homological Projective Duality", Rutgers Algebra Seminar, Rutgers University, Oct 2024 |
| 2024 | "GKZ systems and their applications to toric mirror symmetry", Columbia Enumerative Geometry Seminar, Columbia University, Sept 2024 |
| 2024 | "GKZ Hypergeometric Systems and Their Applications to Mirror Symmetry", poster, Richmond Geometry Meeting, Virginia Commonwealth University, Aug 2024. |
| 2024 | "Central charges in local mirror symmetry", Rutgers Algebra Seminar, Rutgers University, April 2024 |
| 2023 | "Better-behaved GKZ systems and toric mirror symmetry", 5 minutes talk, Algebraic Geometry Northeastern Series, University of Pennsylvania, Oct 2023 |
| 2023 | "Duality of better-behaved GKZ systems", Rutgers Algebra Seminar, Rutgers University, Feb 2023 |

## TEACHING

**University of Maryland**

Math 402: Algebraic Structures, Lecturer, Fall 2025

**Rutgers University**

Math 551: Abstract Algebra I, TA, Fall 2024

Math 111: Precalculus, TA, Spring 2024

Math 552: Abstract Algebra II, TA, Spring 2024

Math 551: Abstract Algebra I, TA, Fall 2023

Math 477: Mathematical Theory of Probability, TA, Fall 2023

Math 244: Differential Equations for Engineering and Physics, TA, Spring 2023

Math 354: Linear Optimization, TA, Fall 2022

Math 251: Multivariable Calculus, TA, Spring 2022

Math 251H: Multivariable Calculus, TA, Fall 2021

## AWARDS AND HONORS

| 2025 | Rutgers SAS Fellowship, Rutgers University, 2025 |
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| 2024 | Summer PhD student Research Fellowship, Rutgers University, 2024 |
| 2019 | Huang Yu Memorial Scholarship, University of Science and Technology of China, 2019 |

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| 2018 | Outstanding Student Scholarship, Silver Award, University of Science and Technology of China |
| 2017 | Outstanding Student Scholarship, Silver Award, University of Science and Technology of China |
| 2015 | Chinese Mathematical Olympaid (CMO), Bronze Medal, 2015 |

Updated October 2025