

# ZHIJIA ZHANG

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## Education

2021–	<b>New York University</b> Ph.D. candidate in Mathematics	<b>New York, NY</b>
2017–2021	<b>New York University Shanghai</b> B.S. in Honors Mathematics	<b>Shanghai, China</b>

## Research interests

Algebraic geometry, (equivariant) birational geometry and rationality problems.

## Publications

- to appear     Rationality of singular cubic threefolds over  $\mathbb{R}$   
(with I. Cheltsov and Yu. Tschinkel)  
accepted by *Advances in Mathematics*, 27 pp.
- to appear     Equivariant geometry of cubic threefolds with non-isolated singularities  
(with I. Cheltsov, L. Marquand and Yu. Tschinkel)  
accepted by *Pure and Applied Mathematics Quarterly*, 18 pp.
- to appear     Stable equivariant birationalities of cubic and degree 14 Fano threefolds  
(with Yu. Tschinkel)  
accepted by *Algebraic Geometry and Physics*, 22 pp.
- 2025           Equivariant geometry of singular cubic threefolds, II  
(with I. Cheltsov, L. Marquand and Yu. Tschinkel)  
*Journal of the London Mathematical Society* **112**(1):e70224, 46 pp.
- 2025           Computing the equivariant Brauer group  
(with A. Pirutka)  
*International Journal of Mathematics* **36**(8), 37 pp.
- 2025           Modular symbols and equivariant birational invariants  
*Journal of Number Theory* **271**, 308–327.
- 2025           Rationality of forms of  $\overline{\mathcal{M}}_{0,n}$   
(with B. Hassett and Yu. Tschinkel)  
*Journal of the London Mathematical Society* **111**(2):e70097, 35 pp.
- 2025           Equivariant geometry of singular cubic threefolds  
(with I. Cheltsov and Yu. Tschinkel)  
*Forum of Mathematics. Sigma* **13**:e9, 52 pp.
- 2025           Equivariant geometry of the Segre cubic and the Burkhardt quartic  
(with I. Cheltsov and Yu. Tschinkel)  
*Selecta Mathematica. New Series* **31**(1):7, 36 pp.

- 2024      Equivariant birational geometry of linear actions  
(with Yu. Tschinkel and K. Yang)  
*EMS Surveys in Mathematical Sciences* **11**(2), 235–276.
- 2022      Combinatorial Burnside groups  
(with Yu. Tschinkel and K. Yang)  
*Research in Number Theory* **8**(2):33, 17 pp.

## Preprints

- 2025      Equivariant unirationality of tori in small dimensions  
(with Yu. Tschinkel), 28 pp., *submitted*
- 2025      Finite abelian groups acting on rationally connected threefolds II: groups of K3 type  
(with K. Loginov and A. Pinardin), 35 pp.
- 2025       $\mathfrak{A}_5$ -equivariant geometry of quadric threefolds  
(with A. Pinardin), 54 pp., *submitted*
- 2025      Conjugacy classes of linear actions in the plane Cremona group  
(with I. Cheltsov and Yu. Tschinkel), 32 pp., *submitted*
- 2025      Cohomological obstructions to equivariant unirationality  
(with Yu. Tschinkel), 16 pp., *submitted*
- 2025      Equivariant unirationality of Fano threefolds  
(with I. Cheltsov and Yu. Tschinkel), 30 pp., *submitted*
- 2024      Birational invariants of volume preserving maps  
(with K. Loginov), 34 pp., *submitted*

## Other writing

- 2024      Equivariant geometry of singular cubic threefolds, *ZAG report*, 5 pp.

## Awards

- 2025      Charles Newman Fellowship, NYU Courant  
*awarded each year to one or two outstanding Mathematics PhD students.*
- 2024      Wilhelm T. Magnus Memorial Prize, NYU Courant  
*awarded for significant contributions to the Mathematical Sciences.*
- 2021–2026      MacCracken Doctoral Fellowship, NYU

## Invited talks

### *Seminars*

- 2025      University of Colorado Boulder, Algebraic Geometry seminar
- 2025      University of Illinois Chicago, Algebraic Geometry seminar
- 2025      Columbia University, Algebraic Geometry seminar
- 2025      University of Illinois Urbana-Champaign, Algebraic Geometry Seminar
- 2025      CUNY Graduate Center, Commutative Algebra and Algebraic Geometry Seminar
- 2025      Princeton University, Algebraic Geometry Seminar
- 2024      University of Nottingham, Pure Mathematics Seminar
- 2024      Imperial College London, Algebraic Geometry Seminar
- 2024      NYU, Algebraic Geometry Seminar

## Conferences

- 2025 University of Hawaii, Polarized Varieties and Their Applications
- 2025 CIRM, Marseille, Cremona Groups
- 2025 University of Miami, New Developments of Birational Geometry
- 2024 ICMS, Edinburgh, Birational Geometry and Number Theory

## Contributed presentations

- 2025 UMass Amherst, Algebraic Geometry Northeastern Series (poster)
- 2025 CSU, Summer Research Institute in Algebraic Geometry (poster)
- 2025 UCSD, Conference on K-stability and Moduli of Varieties (short talk)
- 2024 Boston College, Algebraic Geometry Northeastern Series (short talk)
- 2023 Princeton University, Monodromy and Its Applications (short talk)
- 2022 Simons Foundation, Conference on Higher Dimensional Geometry (poster)

## Conferences attended

- 2025 Duke University, The Fifth Duke Mathematical Journal Conference
- 2024 Simons Foundation, Conference on Arithmetic Geometry, Group Actions and Rationality Problems
- 2024 Stony Brook University, Conference on Higher Dimensional Geometry
- 2023 University of Miami, Higher Invariants in Equivariant and Geometric Topology
- 2023 Stony Brook University, Algebraic Geometry Northeastern Series
- 2022 PCMI Graduate Summer School: Number Theory Informed by Computation

## Teaching

### New York University

- Spring 2025 Teaching assistant, MATH-UA.0343 Algebra I
- Fall 2024, 2025 Teaching assistant, MATH-UA.0348 Honors Algebra I
- Winter 2024, Summer 2025 Instructor, Complex Variables Written Exam Workshop
- Spring 2024, 2025 Grader, MATH-GA.2140 Algebra II
- Spring 2023, 2024 Grader, MATH-GA.2210 Introduction to Number Theory
- Fall 2022, 2023 Grader, MATH-GA.2130 Algebra I

## Service

- 2025 Speaker, cSplash, NYU Courant  
*one-day outreach event of short lectures to local high school students*
- 2024–2025 Member, PhD student survey committee, NYU Courant
- 2021–2023 Co-organizer, Graduate Student and Postdoc Seminar, NYU Courant

Refereeing: *Journal of the London Mathematical Society*, *Taiwanese Journal of Mathematics*, *Algebraic Geometry and Physics*

## Relevant skills

- Languages: Chinese, English
- Softwares: Magma, GAP