Zhiwei Zheng

Curriculum Vitae
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Research Interests

Algebraic geometry, especially K3 surfaces, cubic fourfolds, hyperkähler and Calabi–Yau manifolds; moduli spaces, automorphism groups, period maps, lattice theory, and Deligne–Mostow theory.

Academic Appointments

Sep 2022–present	**Assistant Professor**, Yau Mathematical Sciences Center, Tsinghua University.
Sep 2021–Aug 2022	**Assistant Research Fellow**, Beijing Institute of Mathematical Sciences and Applications (BIMSA).
Oct 2019–Jul 2021	**Postdoctoral Researcher**, Max Planck Institute for Mathematics, Bonn. Mentor: Daniel Huybrechts.

Education and Visiting Positions

Aug 2014–Jul 2019	**Ph.D. in Pure Mathematics**, Tsinghua University. Advisor: Eduard Looijenga.
Jan–Jul 2018	**Visiting Scholar**, Stony Brook University. Mentor: Radu Laza.
Aug 2010–Jul 2014	**B.Sc.**, Tsinghua University, with distinction. Xuetang Program.
Feb–Jul 2013	**Exchange Student**, École Normale Supérieure, France.

Honors and Awards

2024	Ruolin Paper Award, Yau Mathematical Sciences Center.
2022	Doctoral Thesis Gold Prize, ICCM.
2017	Excellent Postgraduate Award, Yau Mathematical Sciences Center.
2014–2019	Tsinghua Future Scholar Scholarship.
2013	National Scholarship.
2012	Academic Outstanding Award.
2009	Gold Medal, **IMO**.
2009	Gold Medal, Chinese Mathematical Olympiad.

Research Funding

2024–2026	NSFC Young Scientists Fund: *Hyper-Kähler Geometry and Conway Group*.

Publications and Preprints

Published and Accepted Papers

[1] *Degenerations to secant cubic hypersurfaces and limiting Hodge structure* (with Renjie Lyu). *Algebraic Geometry*, to appear. arXiv:2206.12670.

[2] *The Complex Ball-quotient Structure of the Moduli Space of Certain Sextic Curves* (with Yiming Zhong). *Journal of the Mathematical Society of Japan* **76** (2024), no. 1, 23–50. arXiv:2110.10630.

[3] *Moduli of Nodal Sextic Curves via Periods of K3 Surfaces* (with Chenglong Yu). *Advances in Mathematics* **430** (2023), Paper No. 109219. arXiv:1809.06589.

[4] *On Abelian Automorphism Groups of Hypersurfaces*. *Israel Journal of Mathematics* **247** (2022), no. 1, 479–498. arXiv:2004.09008.

[5] *Automorphisms and Periods of Cubic Fourfolds* (with Radu Laza). *Mathematische Zeitschrift* **300** (2022), no. 2, 1455–1507. arXiv:1905.11547.

[6] *Orbifold Aspects of Certain Occult Period Maps*. *Nagoya Mathematical Journal* **243** (2021), 137–156. arXiv:1711.02415.

[7] *Moduli Spaces of Symmetric Cubic Fourfolds and Locally Symmetric Varieties* (with Chenglong Yu). *Algebra & Number Theory* **14** (2020), no. 10, 2647–2683. arXiv:1806.04873.

Preprints and Manuscripts

[8] *Finite Symplectic Automorphism Groups of K3 Surfaces in Characteristic Seven* (with Bin Wang). arXiv:2610.25251 (2026).

[9] *A Sharp Bound for the Second Betti Number of Hyperkähler Sixfolds* (with Jie Fu, Bin Wang, and Shihao Wang). arXiv:2610.15803 (2026).

[10] *Finite Symplectic Automorphisms of Hyperkähler Manifolds of $K3^{[n]}$-Type Act Trivially on Discriminant Groups* (with Jie Fu and Shihao Wang). Manuscript, 2026.

[11] *A Proof of Mongardi's Conjecture on Finite Symplectic Group Actions on Hyperkähler Manifolds of $K3^{[n]}$ Type* (with Jie Fu and Shihao Wang). arXiv:2610.11109 (2026).

[12] *Classification of Automorphism Groups of Smooth Cubic Threefolds and Fourfolds* (with Jie Fu and Shihao Wang). arXiv:2609.20403 (2026).

[13] *Small-Subgroup Criteria for Liftability of Automorphism Groups of Smooth Hypersurfaces* (with Baiting Xie). arXiv:2609.15613 (2026).

Publications and Preprints

Preprints and Manuscripts continued

[14] *Automorphism Groups of Smooth Cubic Fourfolds through Lattice Theory* (with Jie Fu).
arXiv:2609.06683 (2026).

[15] *Monodromy Eigenvalues of Milnor Fibers for Line Arrangements* (with Baiting Xie and Chenglong Yu).
arXiv:2609.06416 (2026).

[16] *Sylow Criteria for Liftability of Automorphism Groups of Smooth Hypersurfaces* (with Baiting Xie).
arXiv:2607.23465 (2026).

[17] *Non-symplectic Indices of Automorphism Groups of Smooth Cubic Fourfolds* (with Jie Fu and Shihao Wang).
arXiv:2606.11754 (2026).

[18] *Double integrals and transformation formulas for Appell–Lauricella hypergeometric functions F_D* (with Shihao Wang and Chenglong Yu).
arXiv:2602.03601 (2026).

[19] *Cubic Fourfolds with an Order-7 Automorphism* (with Xuancong He, Yi Li, and Shihao Wang).
arXiv:2509.26359 (2025).

[20] *A Lemma on Leech-like Lattices*.
arXiv:2507.10414 (2025).

[21] *Moduli spaces of sextic curves with simple singularities and their compactifications* (with Chenglong Yu and Yiming Zhong).
arXiv:2505.16727 (2025).

[22] *Commensurability Among Deligne-Mostow Monodromy Groups* (with Chenglong Yu).
arXiv:2411.09682 (2024).

[23] *Finite Groups of Symplectic Automorphisms of Supersingular K3 surfaces in Odd Characteristics* (with Bin Wang).
arXiv:2406.14499 (2024).

[24] *Calabi-Yau Varieties via Cyclic Covers, and Complex Hyperbolic Structures for their Moduli Spaces* (with Chenglong Yu).
arXiv:2401.04006 (2024).

[25] *Abelian Automorphism Groups of Quartic Surfaces and Cubic Fourfolds* (with Tianzhen Peng).
arXiv:2106.14214 (2021).

Textbook Manuscript

Linear Algebra (with Chenglong Yu). In Chinese. Textbook manuscript, version of 12 June 2026. Available online.

Teaching Experience

Fall 2026	Representation Theory of Groups, Tsinghua University.
Spring 2026	Algebra II, Tsinghua University.
Fall 2025	Algebra I, Tsinghua University.
2025	Linear Algebra, Tsinghua University. Co-taught with Jiabin Du and Chenglong Yu.
Fall 2024 Spring 2024	Lie Groups and Lie Algebras, Qiuzhen College, Tsinghua University.
Fall 2023	Abstract Algebra II, Tsinghua University.
Spring 2023	Complex Analysis, Qiuzhen College, Tsinghua University.
Fall 2022	Linear Algebra, Tsinghua University.
Spring 2022	Calabi–Yau Manifolds in Algebraic Geometry, BIMSA.
Fall 2021	Introduction to Lattice Theory and Its Applications, BIMSA.
Oct 2018	K3 Surfaces and Cubic Fourfolds, short course, Tsinghua University.
Fall 2015 Fall 2014	Teaching Assistant, Algebraic Geometry I, taught by Eduard Looijenga, Tsinghua University.
Spring 2015	Teaching Assistant, Basics of Advanced Algebra, taught by Bangming Deng, Tsinghua University.
Summer 2014	Teaching Assistant, Number Theory, taught by Michael Zieve, Tsinghua Summer Math Camp for High School Students.

Seminars and Workshops Organized

Spring 2026	*2026 Spring Learning Seminar*. Co-organized with Baiting Xie and Jie Zhou.
1–3 Nov 2025	*YMSC–SIMIS Joint Workshop on Moduli Spaces and Related Topics*, Tsinghua University. Co-organizer.
2023–present	*Moduli Spaces and Related Topics*, Tsinghua University. Co-organizer.
Nov 2023	*Workshop on Multiple Zeta Values and Iterated Integrals*, Tsinghua University. Co-organizer.
Fall 2021– Spring 2022	*Tsinghua–BIMSA Learning Seminar on Multiple Zeta Values*. Co-organizer.
Fall 2018	*Student Seminar on Higgs Bundles and Hitchin Systems*, Tsinghua University.
Fall 2017	*Ubiquity of Root Systems*, Tsinghua University.
Spring 2017	*Student Seminar on Hodge Theory*, Tsinghua University.
Spring 2016	*Moduli of Curves*, Tsinghua University.
Fall 2015	*Complex Algebraic Surfaces*, Tsinghua University.
Fall 2014	*Topics on Translation Surfaces*, Tsinghua University.

Invited and Contributed Talks

19 Aug 2026	*Automorphism Groups of Cubic Fourfolds*, ICBS, BIMSA, Huairou.
2 Jul 2026	*Automorphism Groups of Cubic Fourfolds: An Overview and New Results*, Workshop on Hodge Theory and Singularities, Weihai.
6 Jan 2026	*Commensurability among Deligne–Mostow Monodromy Groups, and Transformation Relations among Hypergeometric Functions*, International Congress of Chinese Mathematicians (ICCM), Shanghai.
27 Dec 2025	*Commensurability among Deligne–Mostow Monodromy Groups, and Transformation Relations among Hypergeometric Functions*, Conference on Algebraic Geometry, Tsinghua Sanya International Mathematics Forum.
6 Dec 2024	*Commensurability among Deligne–Mostow Monodromy Groups*, BIMSA. Invited by Dali Shen.
4 Jul 2024	*Recent Progresses on Locally Symmetric Varieties with Moduli Meaning*, Zhejiang University, Geometry and Moduli Conference.
25 Mar 2024	*Calabi-Yau Manifolds via Cyclic Covers, and Complex Hyperbolic Structures of their Moduli Spaces*, Wuhan University.
12 Mar 2024	*Calabi-Yau Manifolds via Cyclic Covers, and Complex Hyperbolic Structures of their Moduli Spaces*, Morningside Center of Mathematics, CAS seminar.
26 Feb 2024	*Calabi-Yau Manifolds via Cyclic Covers, and Complex Hyperbolic Structures of their Moduli Spaces*, Xiamen University.
5 Nov 2023	*Calabi-Yau Manifolds via Cyclic Covers, and Complex Hyperbolic Structures of their Moduli Spaces*, 2023 Autumn Algebraic Geometry Communication Conference, University of Science and Technology of China.
4 Dec 2021	*Ball quotients in algebraic geometry*, Workshop on Algebraic and Analytic Geometry, Chinese Academy of Sciences.
27 Apr 2021	*Ball Quotients from Deligne-Mostow Theory and Periods of K3 Surfaces*, Joint Harvard-CUHK-YMSC Differential Geometry Seminar, CMSA, Harvard, online.
15 Feb 2021	*Some New Results on Automorphisms of Hypersurfaces*, Math Physics Seminar, CMSA, Harvard, online.
23 Jan 2020	*Automorphism Groups of Cubic Fourfolds*, Math Physics Joint Seminar, University of Pennsylvania.
24 Oct 2019	*Automorphism and Periods of Cubic Fourfolds*, Algebraic Geometry Seminar, Max Planck Institute for Mathematics, Bonn.
16 Sep 2019	*Automorphism and Periods of Cubic Fourfolds*, Sun Yat-sen University, Guangzhou.
3 Jul 2019	*Classification of Symplectic Automorphism Groups of Smooth Cubic Fourfolds*, Ph.D. Session, The Second National Algebraic Geometry Conference.
13 Jun 2019	*Classification of Symplectic Automorphism Groups of Smooth Cubic Fourfolds*, Contributed Talk, International Congress for Chinese Mathematicians.
7 Jan 2019	*Automorphism groups of cubic fourfolds*, Algebraic Geometry seminar, Beijing International Center for Mathematical Research.
28 Nov 2018	*Geometry of cubic fourfolds and hyper-Kähler manifolds*, Geometry and Physics Seminar, Tsinghua University.
26 Oct 2018	*Compactifications of moduli spaces*, Program of Moduli Spaces and Varieties, Shanghai Center for Mathematical Sciences.
22 Oct 2018	*Introduction to GIT*, Program of Moduli Spaces and Varieties, Shanghai Center for Mathematical Sciences.
20 Jun 2018	*Geometry of Symmetric Cubic Fourfolds*, Algebra Seminar, Indiana University at Bloomington.
9 Apr 2018	*Moduli of Symmetric Cubic Fourfolds*, Geometry Seminar, Texas A&M University.
30 Mar 2018	*Moduli Spaces of Cubic Fourfolds with Automorphisms*, Geometry Seminar, Harvard University.
22 Mar 2018	*Moduli Spaces of Cubic Fourfolds with Specified Prime-order Automorphism, and their compactification*, University of Chicago.
25 Dec 2017	*Orbifold Aspect of Certain Occult Period Maps*, Algebraic Geometry Seminar, Institute of Mathematics, Academy of Mathematics and Systems Science, Chinese Academy of Sciences.