ZHIYU ZHANG

Curriculum Vitae

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Stanford University
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Employment

Stanford University | Fall 2023-
Stanford, CA, USA, Szego Assistant Professor

Simons Laufer Mathematical Sciences Institute | Spring 2023
Berkeley, CA, USA, Visiting Scholar

Education

Massachusetts Institute of Technology | Fall 2018-Fall 2022
Cambridge, MA, USA, Ph.D. in Mathematics

Ecole Normale Superieure | Spring 2018
Paris, France, Visiting Student

Tsinghua University | Fall 2014-Fall 2018
Beijing, B.S. Mathematics

Research Interests

Number theory, representation theory, and applications to main conjectures in arithmetic geometry.
In particular: explicit Langlands program, L-functions and period integrals; (arithmetic) trace formulas, theta correspondence and local-global compatibility; moduli spaces, special cycles and Kudla program.

Research publications

Publications

2025 **Non-reductive cycles and twisted arithmetic transfers for Shimura curves**, RIMS Kôkyûroku, Kyoto University.

2025 **Maximal parahoric arithmetic transfers, small resolution and modularity**, Duke Mathematical Journal.

2022 **Arithmetic transfers, modularity of arithmetic theta series and geometry of local–global Shimura varieties at parahoric levels**, PHD thesis, MIT.

Prepublications and preprints

2025 **Central values of Asai L-functions and twisted Gan–Gross–Prasad conjecture: relative trace formulas**, *with Weixiao Lu and Danielle Wang*, Arxiv:2509.16356.

2025 **On unitary Shimura varieties at ramified primes and arithmetic transfer**, *with Yu Luo and Andreas Mihatsch*, Arxiv:2504.17484. Submitted.

2025 **Weighted special cycles on Rapoport–Zink spaces with almost self-dual level**, *with Qiao He and Baiqing Zhu*, Arxiv:2504.07768v1. Submitted.

2024 **Non-reductive special cycles and twisted arithmetic fundamental lemmas**, Arxiv:2406.00986. Submitted.

2024 **Relative Fundamental Lemmas for Spherical Hecke Algebras and Multiplicative Hitchin Fibrations: the Jacquet–Rallis Case**, *with X. Griffin Wang*, Arxiv:2408.15155. Submitted.

2023 **Kudla-Rapoport conjecture at unramified primes with maximal parahoric level**, *with Sungyoon Cho and Qiao He*, Arxiv:2312.16906. Submitted.

Honors and Awards

2025	SCPKU Faculty Fellowship, Stanford University.
2023	Simons Laufer Mathematical Sciences Institute Postdoctoral Fellowship.
2017	1st Award, S.-T. Yau College Student Mathematics Contest, 2017.
2016-2018	Tsinghua Xuetang Talents Program.

Teaching

Minicourses

Summer undergraduate school in algebraic number theory, Beijing, August 2025.

Stanford University, Stanford, CA

MATH 263C, Topics in Algebraic Geometry (period maps), Spring 2026.
MATH 210C, Lie theory: linear algebraic groups and their actions, Spring 2026.
MATH 263A, Topics in Representation Theory (theta correspondences), Fall 2025.
MATH 145, Algebraic Geometry, Fall 2025.
MATH 145, Algebraic Geometry, Winter 2025.
MATH 216B, Graduate Algebraic Geometry, Winter 2025.
MATH 216A, Graduate Algebraic Geometry, Fall 2024
MATH 263A, Topics in Representation Theory (function field arithmetic), Fall 2024.
MATH 145, Algebraic Geometry, Spring 2024.
MATH 263C, Topics in Representation Theory (relative Langlands duality), Spring 2024.

Massachusetts Institute of Technology (MIT), Cambridge, MA

TA for 18.706, Algebra II, Spring 2022
TA for 18.726, Algebraic Geometry II, Spring 2022
Recitation Instructor for 18.06, Linear Algebra, Fall 2021
TA for 18.737, Algebraic Groups, Spring 2021
TA for 18.786, Number Theory II, Spring 2021
TA for 18.785, Number Theory I, Fall 2020
TA for 18.102, Introduction to Functional Analysis, Spring 2020
TA for 18.786, Number Theory II, Spring 2020
TA for 18.705, Commutative Algebra, Fall 2019

Mentoring

Writing recommendation letters and providing academic suggestions for Stanford undergraduates, including
- Stanford Undergraduate Research Institute in Mathematics (SURIM), 2025.
- Northwestern University Causeway Postbaccalaureate Certificate Program, 2025.
- Indus Center for Academic Excellence (ICAE) Scholarship, 2024.

Research projects suggested for undergraduates:
- Final topic projects for MATH 145, algebraic curves, Spring 2024, Winter 2025.
- "Gelfand-Kirillov dimension of representations of GL_n over a non-archimedean local field.", Kenta Suzuki, arXiv preprint arXiv:2208.05139.

Direct reading with undergraduates:
- Direct reading with Stanford undergraduate Rawley Harrison, Katz-Mazur's book (1985), Summer 2025.
- Directing two MIT students in reading *The 1-2-3 of modular forms*, and additional material on singular moduli, January 2021.
- Directing two MIT students in reading *Categories for the Working Mathematicians*, and chapter 1 of *Kerodon*, January 2020.
- Directing two MIT students in reading *FGA explained*, January 2019.

High school students:
- Math coach of Tsinghua Mathcamp for high school students, Summer 2019.

Service and Seminars

Reviewer for mathematical journals: Algebra & Number Theory, Compositio Mathematica, Forum of Mathematics-Sigma, Forum of Mathematics-Pi, International Journal of Number Theory, International Mathematics Research Notices, Journal of the Institute of Mathematics of Jussieu, Mathematische Annalen..

Reporter for the Oberwolfach Arbeitsgemeinschaft: Relative Langlands Duality, Germany, Mar 30 -April 4, 2025.

Maintaining problem list for the AIM workshop, arithmetic intersection theory on Shimura varieties, Jan 2024.
(Co-)organizer of seminars:
- Stanford representation theory seminar, Stanford, Fall 2025.
- Arithmetic geometry preprint seminar, Stanford, Fall 2023.
- Euler System Program Special Seminar, MSRI, Spring 2023.
- Uniform Mordell, STAGE seminar, MIT, Fall 2021.
- Seminar on Rapoport-Zink spaces, MIT, Summer 2021.
- Crystalline cohomology and prismatic cohomology, STAGE seminar, MIT, Spring 2021.
- The Weil conjectures, STAGE seminar, MIT, Fall 2020.
- p-adic modular forms, STAGE seminar, MIT, Spring 2020.
- Learning seminar on Arithmetic Fundamental Lemma, MIT, Fall 2019.

Actively attending and giving talks on Berkeley-Stanford number theory learning seminar, 2023-2026.

Selected Invited Talks

Conference talk, Relative Langlands Program, Institute for Mathematical Sciences, NUS, Jan 2026.

Conference Talk, Arithmetic Geometry in Shenzhen, Nov 2025.

Workshop Talk on twisted triple products and arithmetic heights, Institute for Advanced Study in Mathematics, Hangzhou, July 2025.

Conference Talk on 37th Automorphic Forms Workshop, University of North Texas, Denton, Texas, April 30 - May 4, 2025.

Colloquium Talk at Rugters University, April 30, 2025.

Seminar Talk at Number Theory Seminar, University of Michigan, April 14, 2025.

Conference Talk on Arithmetic aspects of automorphic forms and automorphic representations, Kyoto University, Jan 20-25, 2025.

Colloquium talk at Faculty Area Research Seminar, Stanford University, Nov 8, 2024.

Seminar talk at Arithmetic Geometry and Number Theory RTG Seminar, UC Berkeley, Nov 4, 2024.

Seminar talk at POSTECH-PMI Number Theory Seminar, Korea, Nov 1, 2024.

Seminar talk at Number Theory / Representation Theory Seminar, University of Wisconsin-Madison, Sep 12, 2024.

Conference talk at BIRS workshop Branching Problems for Representations of Real, p-Adic and Adelic Groups, Kelowna, Canada, July 7-12, 2024.

Conference talk at Simons Symposium: Periods and L-values of Motives (2024), Krün, Germany, June 9-15, 2024.

Seminar talk at UCSB Number Theory seminar, Santa Barbara, April 19, 2024.

Seminar talk at Stanford Number Theory seminar, Stanford University, April 22, 2024.

Conference talk on the AMS Sectional Meetings, Howard University, Washington, DC, April 6-7, 2024.

Seminar talk at Johns Hopkins Number Theory Seminar, March 27, 2024.

Seminar talk at Joint Berkeley-Stanford Algebraic Number Theory, March 12, 2024.

Seminar talk at BIMSA-YMSC Tsinghua Number Theory Seminar, Feb 27, 2024.

Seminar talk at Number Theory / Representation Theory Seminar, University of Wisconsin - Madison, Feb 22, 2024.

Seminar talk at Automorphic Forms and Arithmetic Seminar, Columbia University, Jan 26, 2024.

Seminar talk at Caltech Number Theory Seminar, Nov 30, 2023.

Seminar talk on deformations of absolute Hodge cycles at Joint Berkeley-Stanford Algebraic Number Theory,

Oct 24, 2023.

Conference talk at Arithmetic Algebraic Geometry, a conference on the occasion of Michael Rapoport's 75th birthday at Münster, October 2023.

Conference Talk, Capital Normal University, Beijing, August 7, 2023.

Lecture series on arithmetic geometry, hermitian lattices and theta correspondences, Peking University, July 2023.

Conference talk at Tianyuan Mathematics Research Center, Kunming, July 2023.

Conference talk at Arithmetic Algebraic Geometry conference, the Chinese University of Hong Kong, Hong Kong, June 2023.

Seminar talk at ES Program Special Seminar, MSRI, Berkeley, Mar 2023.

Seminar talk at ES Learning Seminar, MSRI, Berkeley, Mar 1, 2023.

Conference talk at Joint Mathematics Meetings 2023, Boston, Jan 3, 2023.

Seminar talk at Number Theory Seminar, University of Wisconsin-Madison, Nov 3, 2022.

Conference talk at CLAP conference, Bonn University, August 13, 2022.

Seminar talk, University of Maryland, May 19-20, 2022.

Seminar talk, Number theory seminar, Boston College, April 21, 2022.

Seminar talk, Number theory seminar, Yale University, April 19, 2022.

Seminar talk, Number theory seminar, Arizona University, April 5, 2022.

Seminar talk, Number theory seminar, Morningside center of mathematics, September 14, 2021.

Seminar talk, *Almost modularity of arithmetic theta series on unitary Shimura varieties.* Séminaire Mathjeunes, Paris, April 24, 2021.

Other Invited Conferences

New Tools in the Local and Global Langlands Programs, Hangzhou, July 27-Aug 1, 2025.

Beijing-Shanghai Summer School in Mathematics, Shanghai Institute for Mathematics and Interdisciplinary Sciences (SIMIS), June 30-July 11, 2025.

Oberwolfach Arbeitsgemeinschaft: Relative Langlands Duality, Germany, Mar 30 -April 4, 2025.

Oberwolfach Seminar: Reduction of Arithmetic Varieties, Germany, Oct 20-25, 2024.

New Advances in the Langlands Program: Geometry and Arithmetic, Clay Mathematical Institute, University of Oxford, Sep 30-Oct 4, 2024.

Conference on "Arithmetic Geometry" in Honour of Gerd Faltings' 70th Birthday, Bonn, Germany. July 22-26, 2024.

Summer School and Workshop on Relative Langlands Duality, University of Minnesota, June 3-8, 2024.

Arizona Winter School 2024: Abelian Varieties, March 2-6, 2024.

AIM workshop arithmetic intersection theory on Shimura varieties, Pasadena, California, Jan 8-12, 2024.

Conference Arithmétique des formes automorphes, Paris, September 2023.

Shimura Varieties and L-functions (in honor of Shouwu Zhang), MSRI, Berkeley, Mar 2023.

Arizona Winter School 2023: Unlikely Intersections, Mar 2023.

Bonn CLAP conference, August 2022.

IHES Langlands Summer School, July 2022.

Arizona Winter School 2022: Automorphic Forms Beyond GL2, March 2022.

BIRS workshop, Basic Functions, Orbital Integrals, and Beyond Endoscopy, November 2021.

Theta Series: Representation Theory, Geometry, and Arithmetic, Toronto, Canada, July 2021.

Relative Aspects of the Langlands Program, L-Functions and Beyond Endoscopy, CIRM conference, May 2021.

Arbeitsgemeinschaft: Derived Galois Deformation Rings and Cohomology of Arithmetic Groups, April 2021.

AIM workshop, Arithmetic intersection theory on Shimura varieties, January 2021.

Masterclass in Condensed Mathematics, University of Copenhagen, November 2020.

Arizona Winter School 2020: Nonabelian Chabauty, University of Arizona, March 2020.

Arizona Winter School 2019: Topology and Arithmetic, Southwest Center for Arithmetic Geometry, March 2019.

International Conference on Arithmetic Geometry (in honor of M. Rapoport's 71th birthday), Beijing, March 2019.

Master Lectures on Quotients, Stability and Invariants Workshop, Sanya, China, December 2017.

Other experience

Chief editor of *Hesi* (a mathematical magazine run by undergraduates in Tsinghua University), 2017-2018.
Volunteer in Strings 2016, Beijing, August 2016.
Sliver medal, 29th Chinese Mathematical Olympiad, Nanjing, December 2013.

Languages

Chinese, English, French (technical reading), Japanese (technical reading).

Referees

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