Ryan C. Chen

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Positions	**Clay Research Fellow**	
	2025 – 2026	Princeton University
	2026 – 2030	

Education	**Massachusetts Institute of Technology (MIT)**
	2020 – 2025
	Ph.D. in Mathematics
	Advisor: Wei Zhang
	University of Cambridge
	2019 – 2020
	Churchill College
	MASt in Mathematics (Part III)
	Princeton University
	2015 – 2019
	A.B. in Mathematics, summa cum laude
	Senior thesis advisor: Shou-Wu Zhang

Interests	Number theory, arithmetic geometry

Honors and Awards	2025	Clay Research Fellowship
	2024	Charles and Holly Housman Award for Excellence in Undergraduate Teaching, MIT
	2020	MIT Presidential Fellowship
	2019	NSF Graduate Research Fellowship
	2019	Churchill Scholarship
	2018	Barry M. Goldwater Scholarship
	2017	Shapiro Prize for Academic Excellence, Princeton University
	2016	Manfred Pyka Memorial Prize in Physics, Princeton University

In addition to blue hyperlinks, this document also contains many hyperlinks in non-highlighted text, such as collaborator names.

Papers* *Faltings heights and the subleading terms of adjoint L-functions*
                with Weixiao Lu and Wei Zhang.
                    In preparation. Abstract (from Faltings birthday conference).

        Co-rank 1 Arithmetic Siegel–Weil IV: Analytic local-to-global
                Preprint, pp. 1–69.
                `https://arxiv.org/abs/2405.01429` (2024).

        Co-rank 1 Arithmetic Siegel–Weil III: Geometric local-to-global
                Preprint, pp. 1–67.
                `https://arxiv.org/abs/2405.01428` (2024).

        Co-rank 1 Arithmetic Siegel–Weil II: Local Archimedean
                Preprint, pp. 1–29.
                `https://arxiv.org/abs/2405.01427` (2024).

        Co-rank 1 Arithmetic Siegel–Weil I: Local non-Archimedean
                Preprint, pp. 1–111.
                `https://arxiv.org/abs/2405.01426` (2024).
                    Combined I–IV: `https://rycchen.github.io/papers/corank1_ASW.pdf` (2024).

        A refined conjecture for the variance of Gaussian primes across sectors
                with Yujin H. Kim, Jared D. Lichtman, Steven J. Miller, Alina Shubina, Shannon Sweitzer,
                    Ezra Waxman, Eric Winsor, and Jianing Yang.
                Experimental Mathematics, vol. 32 no. 1 (2023), pp. 33–53.
                `https://arxiv.org/abs/1901.07386` (2019).

        p-adic Properties of Hauptmoduln with Applications to Moonshine
                with Samuel Marks and Matt Tyler.
                Symmetry, Integrability, and Geometry: Methods and Applications (SIGMA), vol. 15 (2019), pp. 1–35.
                `https://arxiv.org/abs/1809.02913` (2018).

        Lower-Order Biases in the Second Moment of Dirichlet Coefficients in Families of L-functions
                with Megumi Asada, Eva Fourakis, Yujin Hong Kim, Andrew Kwon, Jared Duker Lichtman,
                    Blake Mackall, Steven J. Miller, Eric Winsor, Karl Winsor, Jianing Yang, and Kevin Yang.
                Experimental Mathematics, vol. 32 no. 3 (2023), pp. 431–456.
                `https://arxiv.org/abs/1808.06056` (2018).

        Spectral statistics of non-Hermitian random matrix ensembles
                with Yujin H. Kim, Jared D. Lichtman, Steven J. Miller, Shannon Sweitzer, and Eric Winsor.
                Random Matrices: Theory and Applications, vol. 8, no. 2 (2019), pp. 1–40.
                `https://arxiv.org/abs/1803.08127` (2018).

        On Reay's relaxed Tverberg conjecture and generalizations of Conway's thrackle conjecture
                with Megumi Asada, Florian Frick, Frederick Huang, Maxwell Polevy, David Stoner
                    Ling Hei Tsang, and Zoe Wellner.
                The Electronic Journal of Combinatorics, vol. 25, no. 3 (2018), pp. 1–14.
                `https://arxiv.org/abs/1608.04279` (2016).

Research talks	2026	The Gross–Zagier Formula, 40 Years Later, Cambridge USA
		TBD
	2026	Relative Langlands and Arithmetic, Marseille FRA
		TBD
	2025	Princeton/IAS Number Theory Seminar, Princeton USA
		Near-center derivatives and arithmetic 1-cycles
	2025	POSTECH-PMI Number Theory Seminar, Pohang KOR (online)
		Near-center derivatives and arithmetic 1-cycles
	2025	Morningside Center of Mathematics, Beijing CHN
		Near-center derivatives and arithmetic 1-cycles
	2025	Number theory day at IASM and Zhejiang University, Hangzhou CHN
		Near-center derivatives and arithmetic 1-cycles
	2025	University of Chicago Number Theory Seminar, Chicago USA
		Near-center derivatives and arithmetic 1-cycles
	2025	University of Wisconsin–Madison Number Theory Seminar, Madison USA
		Near-center derivatives and arithmetic 1-cycles
	2025	Dartmouth Algebra and Number Theory Seminar, Hanover USA
		Near-center derivatives and arithmetic 1-cycles
	2025	University of Michigan Group, Lie and Number Theory Seminar, Ann Arbor USA
		Near-center derivatives and arithmetic 1-cycles
	2025	Harvard Number Theory Seminar, Cambridge USA
		Near-center derivatives and arithmetic 1-cycles
	2025	Johns Hopkins Number Theory Seminar, Baltimore USA
		Near-center derivatives and arithmetic 1-cycles
	2024	The Ohio State University Number Theory Seminar, Columbus USA
		Fourier coefficients and arithmetic 1-cycles
	2024	Columbia Automorphic Forms and Arithmetic Seminar, New York USA
		Fourier coefficients, orbital integrals, and arithmetic 1-cycles
	2024	MIT Number Theory Seminar, Cambridge USA
		Co-rank 1 Arithmetic Siegel–Weil
	2024	Arithmetic intersection theory on Shimura varieties (AIM workshop), Pasadena USA
		Co-rank 1 Arithmetic Siegel–Weil
	2019	MAA Undergraduate Poster Session at JMM, Baltimore USA
		p-adic Properties of Hauptmoduln with Applications to Moonshine
	2017	Ohio State Young Mathematicians Conference, Columbus USA
		Spectral statistics of non-Hermitian random matrix ensembles
	2017	Ohio State Young Mathematicians Conference, Columbus USA
		Bounds for vanishing of L-functions at the central point
	2017	MAA Undergraduate Poster Session at JMM, Atlanta USA
		On Reay's relaxed Tverberg conjecture
Other talks	2025	Spring learning seminar at MIT
		On the meromorphic continuation of Eisenstein series after Bernstein and Lapid
	2024	Fall learning seminar on arithmetic inner product formula at MIT
		Beilinson–Bloch height pairing
	2024	HMMT education talk
		Sphere packing
	2024	Spring learning seminar on Xiao–Zhu at MIT
		Introduction to "Cycles on Shimura varieties via Geometric Satake" by L. Xiao and X. Zhu
	2024	Spring internal seminar at MIT
		Co-rank 1 Arithmetic Siegel–Weil
	2023	Fall learning seminar at MIT
		Integral canonical models of orthogonal Shimura varieties
	2023	Fall learning seminar at MIT
		Integral models of orthogonal Shimura varieties and K3 surfaces
	2022	Program associate seminar at SLMath/MSRI
		Rapoport–Zink uniformization and Kudla–Rapoport cycles
	2022	Fall internal learning seminar at MIT
		Introduction to Kudla's program
	2022	Summer learning seminar on Gross–Zagier at MIT
		Archimedean local heights

2022	MIT graduate student seminar (PUMAGRASS)
	Polytopes and toric varieties
2021	Seminar on Topics in Arithmetic, Geometry, etc. (STAGE) at MIT
	Moduli spaces of curves and abelian varieties
2021	Fall learning seminar on p-adic shtukas at MIT
	Perfectoid spaces
2021	Summer learning seminar on moduli of p-divisible groups at MIT
	Local models for Rapoport–Zink spaces
2021	Polymath Jr. number theory student seminar series
	Diophantine equations and geometry
2020	University of Cambridge Part III Seminar Series
	Integer points, rationality, and moduli spaces
2019	Princeton undergraduate math colloquium
	Integer points, Diophantine geometry, and moduli spaces
2019	Arithmetic geometry internal seminar at Princeton
	Diophantine problems and p-adic period mappings

Mentoring

2021 Polymath Jr. Mentor
Co-mentored two undergraduate student projects in number theory,
with Steven J. Miller and Ezra Waxman.

One-level density for a family of L-functions associated to super-even characters over function fields.
Dang Dang, Hari Iyer, Sanford Lu, Steven J. Miller, and Ezra Waxman. In preparation.

A Hardy–Littlewood Conjecture for Artin Primes.
Mengzhen Liu and Ezra Waxman. In preparation.

Mentor, Grad-Undergrad Math Mentoring Initiative (GUMMI) at MIT
2020 – present

Teaching

Massachusetts Institute of Technology (MIT)

2025 Spring	Teaching Assistant for 18.102 (Functional analysis)
2024 Fall	Teaching Assistant for 18.112 (Complex analysis)
2024 Spring	Recitation instructor for 18.06 (Linear algebra)

Princeton University

2016 Fall	Undergraduate Course Assistant/Grader for MAT 350 (Differential Manifolds)

Other Service and Organization

2024 Spring	Co-organizer for internal number theory student seminar at MIT
2023 Fall	Co-organizer for internal number theory student seminar at MIT
2023 Spring	Social co-chair for program associates at SLMath/MSRI

Undergraduate Work

Princeton undergraduate work
2018 – 2019 Advisor for undergraduate senior thesis: Shou-Wu Zhang
Integer points on complements of dual curves and on genus one modular curves

2018 Advisor for undergraduate junior paper: Christopher Skinner

2018 Emory REU in mathematics
Advisors: Ken Ono and John F. R. Duncan

2017 SMALL REU in mathematics at Williams College
Advisors: Steven J. Miller and Ezra Waxman

2016 Summer Program for Undergraduate Research in mathematics at Cornell University
Advisor: Florian Frick

Conference, Program, and Workshop Attendance

2026	The Gross–Zagier formula, 40 years later, Cambridge USA
2026	International Congress of Mathematicians, Philadelphia USA
2026	Relative Langlands and Arithmetic, Marseille FRA
2025	Arithmetic and Diophantine Geometry ... (Ullmo 60th), Bures-sur-Yvette FRA
2025	The Legacy of John Tate, and Beyond, Cambridge USA
2024	Representation theory days (Lusztig conference), Cambridge USA
2024	The Mordell conjecture 100 years later, Cambridge USA
2024	AIM workshop: Arithmetic intersection theory on Shimura varieties, Pasadena USA
2023	Conference on Global Langlands, Shimura varieties, and shtukas, Bonn DEU
2023	Coates Memorial Conference (Iwasawa 2023), Cambridge UK
2023	SLMath/MSRI semester program: Algebraic Cycles, L-values, and Euler Systems, Berkeley USA
2022	Arizona Winter School: Automorphic forms beyond GL_2, Tucson USA
2021	Theta Series: Representation Theory, Geometry, and Arithmetic (Kudla 70th), Toronto CAN (virtual)