Ryan C. Chen

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

Education

Massachusetts Institute of Technology (MIT)
2020 –
Ph.D. in Mathematics (expected 2025)
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
	2025	University of Wisconsin–Madison number theory seminar, Madison USA
		TBD
	2025	Dartmouth Algebra and Number Theory Seminar, Hanover USA
		TBD
	2025	University of Michigan Group, Lie and Number Theory seminar, Ann Arbor USA
		TBD
	2025	Harvard number theory seminar, Cambridge USA
		TBD
	2025	Johns Hopkins number theory seminar, Baltimore USA
		TBD
	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	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)** 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 2025 Arithmetic and Diophantine Geometry ... (Ullmo 60th), Bures-sur-Yvette FRA 2025 Arithmetic cycles, modular forms, and L-functions (Darmon 60th), Montreal CAN 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)