

# Ryan C. Chen

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November 2025

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      2025    [Clay Research Fellowship](#)  
Awards  
                  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](#)

- Papers\* *Faltings heights and the subleading terms of adjoint  $L$ -functions*  
with Weixiao Lu and Wei Zhang.  
In preparation. [Abstract](#) (from 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](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 Poley, 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).

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\*Listed in reverse order of first arXiv appearance (with arXiv year also indicated).  
arXiv author ID link: [https://arxiv.org/a/chen\\_r\\_2](https://arxiv.org/a/chen_r_2).

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

- 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 – 2025

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