Ryan C. Chen

Department of Mathematics Massachusetts Institute of Technology 182 Memorial Dr., Cambridge, MA 02139

Website: rycchen.github.io January 2025

Email: rcchen@mit.edu

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 2025 (

Awards

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).
```

^{*}Listed in reverse order of first arXiv appearance (with arXiv year also indicated). arXiv author ID link: https://arxiv.org/a/chen_r_2.

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 2026 Harvard number theory seminar, Cambridge USA TBD 2025 Johns Hopkins number theory seminar, Baltimore USA TBD 2026 Johns Hopkins number theory seminar, Baltimore USA TBD 2021 The Ohio State University number theory seminar, Columbus USA Fourier coefficients and arithmetic Leycles 2024 Columbia automorphic forms and arithmetic leycles 2024 MIT number theory seminar, Cambridge USA 2021 MIT number theory seminar, Cambridge USA 2021 Arithmetic intersection theory on Shimura varieties (AIM workshop), Pasadena USA 2022 Co-mark 1 Arithmetic Siegel-Weil 2039 MAA Undergraduate Poster Session at JMM, Baltimore USA 2040 p-ade Properties of Hauptimodule with Appleations to Moonshine 2041 Ohio State Young Mathematicians Conference, Columbus USA 2050 Spectral statistics of Insulptimodule with Appleations to Moonshine 2041 Ohio State Young Mathematicians Conference, Columbus USA 2050 Bounds for vanishing of 1-functions at the certain point 2041 MAA Undergraduate Poster Session at JMM, Atlanta USA 2051 Ohio State Young Mathematicians Conference, Columbus USA 2064 Bounds for vanishing of 1-functions at the certain point 2075 MAA Undergraduate Poster Session at JMM, Atlanta USA 2076 On Reny's relaxed Percheny conjecture 2076 Pall learning seminar on arithmetic inner product formula at MIT 2077 Hauring seminar on Siao Zhu at MIT 2078 Introduction to Vigles on Shimura varieties via Geometric Satake" by L. Xiao and X. Zhu 2079 Spring internal seminar at MIT 2070 Introduction to Vigles on Shimura varieties and K3 surfaces 2071 Fall learning seminar on Gross-Zagier at MIT 2071 Activation of Poster varieties 2072 Summer learning seminar on Gross-Zagier at MIT 2073 Hardinary Seminar on Depties in Arithmetic Geometry, etc. (STAGE) at MIT 2074 Depties and toric varieties 2075 Polymath	Research talks	2026	The Gross–Zagier formula, 40 years later, Cambridge USA TBD
TBD 202 102 103 104 105 105 106 107 108 108 108 108 108 108 108		2025	University of Wisconsin–Madison number theory seminar, Madison USA
TID 2025 Johns Hookins number theory seminar, Cambridge USA TIBD 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 and arithmetic seminar, New York USA Fourier coefficients, orbital integrals, and arithmetic 1-cycles 2024 MIT number theory seminar, Cambridge USA Cormak 1 Arithmetic Siegel Weil 2024 Arithmetic intersection theory on Shimura varieties (AIM workshop), Pasadena USA Cormak 1 Arithmetic Siegel Weil 2039 MAA Undergraduate Poster Session at JMM, Baltimore USA padie Properties of Hauptmodulu with Applications to Moonshine 2040 Ohio State Young Mathematicians Conference, Columbus USA Spectral statistics of non-Hermitian random matrix ensembles 2041 Ohio State Young Mathematicians Conference, Columbus USA Spectral statistics of non-Hermitian random matrix ensembles 2047 Ohio State Young Mathematicians Conference, Columbus USA Spectral statistics of non-Hermitian random matrix ensembles 2048 Ohio State Young Mathematicians Conference, Columbus USA Spectral statistics of non-Hermitian random matrix ensembles 2049 MAA Undergraduate Poster Session at JMM, Atlanta USA On Reay's relaxed Teerberg conjecture Other talks 2041 Fall learning seminar on arithmetic inner product formula at MIT Belimson-Bloch height pairing 2042 HMMT education talk Sphere packing 2043 Farjing learning seminar on Axiao Zhu at MIT Introduction to "Cycles on Shimura varieties via Geometric Satake" by L. Xiao and X. Zhu Spring internal sominar at MIT Integral canomical models of orthogonal Shimura varieties 2042 Parjing internal sominar at AIT Integral canomical models of orthogonal Shimura varieties 2043 Fall learning seminar at MIT Introduction to Kudla's program 2045 Parjing a seminar on Cross Zagier at MIT Archimedean local heights The geninar on Topics in Arithmetic, Geometry, etc. (STAGE) at MIT Moduli spaces of curves and abelian varieties 2041		2025	
Tibl 202 203 204 Tibl 204 Tibl 204 Tibl 205 Tibl 205 Tibl 206 Tibl 206 Tibl 206 Tibl 206 Tibl 207 Tibl 208 Tibl Tibl 208 Tibl 208 Tibl Tibl 208 Tibl Tibl 208 Tibl Ti		2025	
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 I Arithmetic Stepel Weil 2024 Arithmetic intersection theory on Shimura varieties (AlM workshop), Pasadena USA Co-rank I Arithmetic Stepel Weil 2019 MAA Undergraduate Poster Session at JMM, Baltimore USA p-adic Properties of Houptmodulu with Applications to Monoshine 2017 Ohio State Young Mathematicians Conference, Columbus USA Spectral statistics of non-Herwitian random watrix 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 Tverbery conjecture Other talks 2024 Fall learning seminar on arithmetic inner product formula at MIT Beilinson-Bloch height pairing 2024 Iffilm Televation 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 I Arithmetic Stepel-Weil 2023 Fall learning seminar at MIT Integral canonical models of orthogonal Shimura varieties 2023 Fall learning seminar at MIT Integral monical of orthogonal Shimura varieties 2024 Program associate seminar at MIT Integral canonical models of orthogonal Shimura varieties 2025 Fall internal learning seminar at MIT Integral models of orthogonal Shimura varieties 2026 Fall internal learning seminar on Gross-Zagier at MIT Archimedean local heights 2027 MIT graduate student seminar (PUMAGRASS) Polytopes and toric varieties 2028 Fall learning seminar on moduli of p-divisible groups at MIT Local models for Rapport Zink spaces 2029 Polymath Jr. number theory student seminar series Diophantine equations and decompting spaces 2020 University of Cambridge Part III Semina		2025	
Fourier coefficients and arithmetic l-cycles 2024 Columbia automorphic forms and arithmetic seminar, New York USA Fourier coefficients, orbital integrals, and arithmetic l-cycles 2024 MIT number theory seminar, Cambridge USA Co-rank I Arithmetic Siegel-Weil 2024 Arithmetic intersection theory on Shimura varieties (AIM workshop), Pasadena USA Co-rank I Arithmetic Siegel-Weil 2019 MAA Undergraduate Poster Session at JMM, Baltimore USA p-adic-Properties of Houpmondulu with Applications to Moonshine 2017 Ohio State Young Mathematicians Conference, Columbus USA Spectral statistics of non-Hermatina random matric ensembles 2017 Ohio State Young Mathematicians Conference, Columbus USA Bounds for wanishing of L-pinctions at the central point 2018 MAA Undergraduate Poster Session at JMM, Atlanta USA On Reny's relaxed Twerbery conjecture Other talks 2024 Fall learning seminar on arithmetic inner product formula at MIT Beliknson-Bloch height pairing 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 I Arithmetic Siegel-Weil 2023 Fall learning seminar at MIT Integral canonical models of orthogonal Shimura varieties 2023 Fall learning seminar at MIT Integral canonical models of orthogonal Shimura varieties 2024 Program associate seminar at MIT Integral canonical models of orthogonal Shimura varieties 2025 Fall learning seminar at MIT Integral models of orthogonal Shimura varieties 2026 Fall learning seminar on Gross-Zagier at MIT Archimedon local heights 2027 MIT graduate student seminar (PUMAGRASS) Polytopes and toric varieties 2028 Fall learning seminar on moduli of p-divisible groups at MIT Moduli spaces of curves and abelian varieties 2029 Forminar on Topics in Arithmetic, Geometry, etc. (STAGE) at MIT Moduli spaces of curves and abelian varieties 2020 University of Cambridge Part III Seminar Series Diophantine equations and geometry, and moduli spaces		2025	
Fourier coefficients, orbital integrals, and arithmetic 1-cycles MIT number theory seminar, Cambridge USA Co-rank 1 Arithmetic Siegel-Weil 2014 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 Hauptmodulu with Applications to Moonshine 2017 Ohio State Young Mathematicians Conference, Columbus USA Spectral statistics of non-Hermitian random matric ansembles 2017 Ohio State Young Mathematicians Conference, Columbus USA Bounds for vanishing of L-functions at the central point MAA Undergraduate Poster Session at JMM, Atlanta USA On Reay's relaxed Twerbery conjecture Other talks 2024 Fall learning seminar on arithmetic inner product formula at MIT Beilmson-Bloch height pairing 2024 HMMT education talk Sphere packing 2024 Sphere packing 2024 Sping learning seminar on Xiao-Zhu at MIT Introduction to "Cycles on Shimura varieties via Geometric Satake" by L. Xiao and X. Zhu 2024 Sping internal seminar at MIT Co-rank 1 Arithmetic Siegel-Weil 2025 Fall learning seminar at MIT Integral canonical models of orthogonal Shimura varieties 2026 Fall learning seminar at MIT Integral models of orthogonal Shimura varieties and K9 surfaces 2020 Frogram associate seminar at SLMath/MSRI Repoport-Zink uniformization and Kudla-Rapoport cycles 2021 Fall internal learning seminar on A SLMath/MSRI Repoport-Zink uniformization and Kudla-Rapoport cycles 2022 Fall internal learning seminar on Gross-Zagier at MIT Archimetedan local heights 2023 Fall carning seminar on moduli of p-divisible groups at MIT Moduli spaces of curves and abelian varieties 2021 Fall learning seminar on moduli of p-divisible groups at MIT Local models for Rapoport Zink spaces 2021 Polymath Ir. number theory student seminar series Diophantine equations and geometry 2020 University of Cambridge Part III Seminar Series Integer points, rationality, and moduli spaces		2024	
### Arithmetic Siegel-Weil 2024 Arithmetic intersection theory on Shimura varieties (AIM workshop), Pasadena USA Co-vank 1 Arithmetic Siegel-Weil 2019 MAA Undergraduate Poster Session at JMM, Baltimore USA p-adic Properties of Hauptmodulu 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 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 2018 MAA Undergraduate Poster Session at JMM, Atlanta USA On Reny's relaxed Twerbery conjecture		2024	
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 Hauptmodulu 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 Twerberg 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 canonical 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 Seminiar on Topics in Arithmetic, Geometry, etc. (STAGE) at MIT Moduli spaces of curves and abelian varieties 2021 Fall learning seminar on moduli of p-divisible groups at MIT Local models for Rapoport-Zink spaces 2021 Summer learning seminar on Moduli spaces 2021 Integer points, Tulnular theory student seminar series Diophantine equations and geometry 2020 University of Cambridge Part III Seminar Series Integer points, Tulnular theory student seminar series Polymant Jr. Local models for Rapoport-Zink spaces		2024	MIT number theory seminar, Cambridge USA
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 Beclinson-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 canonical models of orthogonal Shimura varieties 2020 Fall learning seminar at MIT Rapoport-Zink uniformization and Kudla-Rapoport cycles 2021 Fall internal learning seminar at MIT Rapoport-Zink uniformization and Kudla-Rapoport cycles 2022 Fall internal learning seminar 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 Summer learning seminar on moduli of p-divisible groups at MIT Local models for Rapoport Zink spaces 2021 Polymant Jr. number theory student seminar series Diophantine equations and geometry 2020 University of Cambridge Part III Seminar Series Integer points, Toiphantine geometry, and moduli spaces		2024	Arithmetic intersection theory on Shimura varieties (AIM workshop), Pasadena USA
Spectral statistics of non-Hermitian random matrix ensembles Ohio State Young Mathematicians Conference, Columbus USA Bounds for vanishing of L-functions at the central point 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 2023 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 moduli of p-divisible groups at MIT Local models for Rapoport Zink spaces 2021 Viniversity of Cambridge Part III Seminar Series Integer points, Diophantine geometry, and moduli spaces 2029 Princeton undergraduate math colloquium Integer points, Diophantine geometry, and moduli spaces		2019	MAA Undergraduate Poster Session at JMM, Baltimore USA
2017 Ohio State Young Mathematicians Conference, Columbus USA Bounds for vanishing of L-functions at the central point 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 2026 Spring learning seminar on Xiao Zhu at MIT Introduction to "Cycles on Shimura varieties via Geometric Satake" by L. Xiao and X. Zhu 2027 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 SLIMath/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 2023 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 Seminar on Topics in Arithmetic, Geometry, etc. (STAGE) at MIT Local models for Rapoport-Zink spaces 2021 Polymath Jr. number theory student seminar series Diophantine equations and geometry University of Cambridge Part III Seminar Series Integer points, Diophantine geometry, and moduli spaces		2017	
Bounds for vanishing of L-functions at the central point 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 1024 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 2025 Fall internal learning seminar at MIT Introduction to Kudla's program 2026 Summer learning seminar on Gross-Zagier at MIT Archimedean local heights 2027 MIT graduate student seminar (PUMAGRASS) Polytopes and toric varieties 2028 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 Polymath Jr. number theory student seminar series Diophantine quations and geometry University of Cambridge Part III Seminar Series Integer points, Diophantine geometry, and moduli spaces		2017	
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 unformization 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 2023 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, Diophantine geometry, and moduli spaces			Bounds for vanishing of L-functions at the central point
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 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 2023 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, Diophantine geometry, and moduli spaces Princeton undergraduate math colloquium Integer points, Diophantine geometry, and moduli spaces		2017	
Beilinson-Bloch height pairing 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 Fall learning seminar at MIT Integral canonical models of orthogonal Shimura varieties Fall learning seminar at MIT Integral models of orthogonal Shimura varieties and K3 surfaces Program associate seminar at SLMath/MSRI Rapoport-Zink uniformization and Kudla-Rapoport cycles Fall internal learning seminar at MIT Introduction to Kudla's program 2022 Summer learning seminar on Gross-Zagier at MIT Archimedean local heights 2023 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			On Realy's retaited Tververy conjecture
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 2024 MIT graduate student seminar (PUMAGRASS) Polytopes and toric varieties 2025 Seminar on Topics in Arithmetic, Geometry, etc. (STAGE) at MIT Moduli spaces of curves and abelian varieties 2021 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 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 2021 Princeton undergraduate math colloquium Integer points, Diophantine geometry, and moduli spaces	Other talks	2024	Fall learning seminar on arithmetic inner product formula at MIT
Sphere packing Spring learning seminar on Xiao-Zhu at MIT Introduction to "Cycles on Shimura varieties via Geometric Satake" by L. Xiao and X. Zhu Spring internal seminar at MIT Co-rank 1 Arithmetic Siegel-Weil Fall learning seminar at MIT Integral canonical models of orthogonal Shimura varieties Fall learning seminar at MIT Integral models of orthogonal Shimura varieties and K3 surfaces Program associate seminar at SLMath/MSRI Rapoport-Zink uniformization and Kudla-Rapoport cycles Fall internal learning seminar at MIT Introduction to Kudla's program Summer learning seminar on Gross-Zagier at MIT Archimedean local heights MIT graduate student seminar (PUMAGRASS) Polytopes and toric varieties Seminar on Topics in Arithmetic, Geometry, etc. (STAGE) at MIT Moduli spaces of curves and abelian varieties Fall learning seminar on p-adic shtukas at MIT Perfectoid spaces Summer learning seminar on moduli of p-divisible groups at MIT Local models for Rapoport-Zink spaces Polymath Jr. number theory student seminar series Diophantine equations and geometry University of Cambridge Part III Seminar Series Integer points, rationality, and moduli spaces Princeton undergraduate math colloquium Integer points, Diophantine geometry, and moduli spaces		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		2024	
2024 Spring internal seminar at MIT		2024	
Co-rank 1 Arithmetic Siegel-Weil Fall learning seminar at MIT Integral canonical models of orthogonal Shimura varieties Fall learning seminar at MIT Integral models of orthogonal Shimura varieties and K3 surfaces Program associate seminar at SLMath/MSRI Rapoport-Zink uniformization and Kudla-Rapoport cycles Fall internal learning seminar at MIT Introduction to Kudla's program Summer learning seminar on Gross-Zagier at MIT Archimedean local heights MIT graduate student seminar (PUMAGRASS) Polytopes and toric varieties Seminar on Topics in Arithmetic, Geometry, etc. (STAGE) at MIT Moduli spaces of curves and abelian varieties Fall learning seminar on p-adic shtukas at MIT Perfectoid spaces Summer learning seminar on moduli of p-divisible groups at MIT Local models for Rapoport-Zink spaces Polymath Jr. number theory student seminar series Diophantine equations and geometry University of Cambridge Part III Seminar Series Integer points, rationality, and moduli spaces Princeton undergraduate math colloquium Integer points, Diophantine geometry, and moduli spaces		2024	
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		2024	
Integral canonical models of orthogonal Shimura varieties Fall learning seminar at MIT Integral models of orthogonal Shimura varieties and K3 surfaces Program associate seminar at SLMath/MSRI Rapoport-Zink uniformization and Kudla-Rapoport cycles Fall internal learning seminar at MIT Introduction to Kudla's program Summer learning seminar on Gross-Zagier at MIT Archimedean local heights MIT graduate student seminar (PUMAGRASS) Polytopes and toric varieties Seminar on Topics in Arithmetic, Geometry, etc. (STAGE) at MIT Moduli spaces of curves and abelian varieties Fall learning seminar on p-adic shtukas at MIT Perfectoid spaces Summer learning seminar on moduli of p-divisible groups at MIT Local models for Rapoport-Zink spaces Polymath Jr. number theory student seminar series Diophantine equations and geometry University of Cambridge Part III Seminar Series Integer points, rationality, and moduli spaces Princeton undergraduate math colloquium Integer points, Diophantine geometry, and moduli spaces		2023	
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			
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		2023	
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		2022	
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		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		2022	
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			
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		2022	
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		2022	
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			- · · · · · · · · · · · · · · · · · · ·
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		2021	
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		2021	· ·
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		2021	
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		2021	
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			
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		2021	
Integer points, rationality, and moduli spaces 2019 Princeton undergraduate math colloquium Integer points, Diophantine geometry, and moduli spaces		2020	
2019 Princeton undergraduate math colloquium Integer points, Diophantine geometry, and moduli spaces		_0_0	
		2019	Princeton undergraduate math colloquium
20110 Annthon street manner street intermed association of District Ann		0010	
2019 Arithmetic geometry internal seminar at Princeton Diophantine problems and p-adic period mappings		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

 $2024~{\rm Spring}$ $\,$ 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 GL₂, Tucson USA

2021 Theta Series: Representation Theory, Geometry, and Arithmetic (Kudla 70th), Toronto CAN (virtual)