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education

2. Massachusetts Institute of Technology, PhD in Mathematics 2019-2024
   Advisor: Wei Zhang
1. Princeton University, B.A. Mathematics 2015-2019

research interests

I am interested in arithmetic aspects of the (relative) Langlands program, particularly in the role of Shimura varieties, and applications to the Beilinson–Bloch–Kato conjectures, Euler systems and Iwasawa theory.

papers

5. First explicit reciprocity law for unitary Friedberg-Jacquet periods 2023
   in preparation
4. Spherical functions on symmetric spaces of Friedberg-Jacquet type 2023
   preprint, `https://arxiv.org/abs/2311.00148`
3. Spherical functions of symmetric forms and a conjecture of Hironaka 2023
   preprint, `https://arxiv.org/abs/2311.00147`
2. On Howard's main conjecture and the Heegner point Kolyvagin system 2019
   Undergraduate senior thesis, preprint, `https://arxiv.org/abs/1908.09197`
1. A proof of Kolyvagin's conjecture via the BDP main conjecture 2019
   Undergraduate junior paper, preprint, `https://arxiv.org/abs/1909.07835`

invited talks

3. TSIMF: upcoming January 2024
2. MSRI/SLMath: Arithmetic level raising and reciprocity laws Mar 2023
1. JMM: On Howard's MC and the Heegner point Kolyvagin system Jan 2020

contributed talks

7. Introduction to compactifications of Shimura varieties Apr 2023
6. Iwasawa theory of elliptic curves Nov 2022
5. Introduction to Iwasawa theory Nov 2022
4. Euler system of cyclotomic units Oct 2022
3. Examples of Rapoport–Zink spaces Aug 2021
2. Formulation of RZ data Aug 2021
1. p-adic modular forms à la Katz Feb 2020

conferences attended

5. TSIMF Workshop on special values of L-functions January 2024
4. AIM Workshop on analytic, arithmetic, and geometric aspects of automorphic forms January 2024
3. MSRI/SLMath Algebraic Cycles, L-Values, and Euler Systems Spring 2023
2. IHES Summer School on the Langlands program July 2022
1. Arizona Winter School Mar 2022
   Study group on Automorphic Forms and the Theta Correspondence

organizing

1. Learning seminar on Euler systems Fall 2022
   `https://math.mit.edu/~muriloz/seminar2022/`

academic awards

7. Frank and Brennie Morgan Prize (hon. mention), AMS/MAA/SIAM — 2020
   Awarded for outstanding research in mathematics by an undergraduate
6. The Middleton Miller'29 prize — 2018
   Awarded for the best independent work in mathematics
5. Peter A. Greenberg'77 Memorial Prize — 2018
   Awarded for outstanding accomplishments in mathematics
4. Putnam examination — 2016-2018
   N1 prize (6th-14th) in 2016 and 2018, Honorable mention in 2017
3. Shapiro prize for academic excellence — 2017, 2018
   Award for outstanding academic achievement
2. The Class of 1861 prize — 2017
   Awarded to the sophomore with the best record on the Putnam
1. International mathematics olympiad — 2014-2015
   Silver medals in 2014 and 2015

mentorship

3. High School Enrichment Program Teacher — 2021-Present
   Virtual classes with students from my former high school on undergraduate-level topics in number theory
2. MIT Directed Reading Program — Winter 2020
   Analytic Number Theory
1. MIT Directed Reading Program — Winter 2020
   Modular Forms and Elliptic Curves

teaching

8. 18.701 Algebra I — Fall 2023
7. 18.950 Differential Geometry — Fall 2023
6. 18.02 Multivariable Calculus — Fall 2022
5. 18.065 Matrix Methods in Data Analysis & Machine Learning — Spring 2021
4. 18.701 Algebra I — Fall 2021
3. 18.700 Linear Algebra — Fall 2021
2. 18.702 Algebra II — Spring 2020
1. 18.100A Real Analysis — Fall 2020