Luochen ZHAO

Contact Information

Morningside Center of Mathematics
Chinese Academy of Sciences
No. 55, Zhongguancun East Road
Haidian District, Beijing, 100190, PRC

Office: 505 Morningside Building
luochenzhao@amss.ac.cn
https://luochenzhao.github.io

Employment

Morningside Center of Mathematics — Beijing, China
Postdoctoral member — Sept 2024 – Now
Mentor: Xin Wan

Hebrew University of Jerusalem — Jerusalem, Israel
Postdoctoral member under the ERC grant *Arithmetic of Curves and Jacobians* — Sept 2023 – Aug 2024
Mentor: Ari Shnidman

Academic Visits

University of Ottawa — Ottawa, Canada
Host: Antonio Lei; supported by the Visiting Researchers Program of the University of Ottawa — Nov 2025

Morningside Center of Mathematics — Beijing, China
Host: Xin Wan — Nov 2023 – Aug 2024

Education

Johns Hopkins University — Baltimore, MD, USA
Ph.D in mathematics — Sept 2019 – May 2023
Thesis advisor: Antonio Lei Department advisor: Yiannis Sakellaridis
Research area: Number theory, p-adic L-functions, Iwasawa theory, p-adic analysis

Rutgers, The State University of New Jersey — New Brunswick, NJ, USA
Ph.D candidate in mathematics — Sept 2017 – Aug 2019

Peking University — Beijing, China
Bachelor of Science in mathematics — Sept 2013 – Jul 2017
Supervisor: Ruochuan Liu

Publications & Preprints

7. On the Bernoulli–Hurwitz periods
Preprint. https://arxiv.org/pdf/2510.17939.

6. On the structure of the Bloch–Kato Selmer groups of modular forms over anticyclotomic $\mathbf{Z}_p$-towers
(with A. Lei, L. Mastella) Accepted for publication in *Research in the Mathematical Sciences*.
https://arxiv.org/pdf/2409.11966.

5. On a product formula of bivariate p-adic Gamma values
Preprint. https://arxiv.org/pdf/2311.04805.

4. On the BDP Iwasawa main conjecture for modular forms
(with Antonio Lei) *Manuscripta Mathematica* 173, 867-888 (2024).
https://doi.org/10.1007/s00229-023-01485-4; https://arxiv.org/pdf/2211.04377.

3. Sum expressions for p-adic Hecke L-functions of totally real fields
Pure and Applied Mathematics Quarterly, Vol. 19, No. 2, 597–639, 2023.
https://doi.org/10.4310/PAMQ.2023.v19.n2.a7; https://arxiv.org/pdf/2204.07364.

2. Sum expressions for Kubota-Leopoldt p-adic L-functions
Proceedings of the Edinburgh Mathematical Society 65 (2022), no. 2, 460–479.
https://doi.org/10.1017/S0013091522000177; https://arxiv.org/pdf/2201.08870.

1. Note on p-adic local functional equation
p-Adic Numbers, Ultrametric Analysis and Applications, 2022, Vol. 14, No. 3, pp. 238–264.
https://doi.org/10.1134/S2070046622030037; https://arxiv.org/pdf/2201.08874.

Grants

Visiting Researchers Programme – CAS and C9 League — University of Ottawa, 2025
co-investigator on a research collaboration program valued $5,000 CAD

Scholarships

Professor Joel Dean Award — Johns Hopkins, 2022
for excellence in the teaching of mathematics

Academic Excellence Award — Rutgers, 2017
for passing written qualifying exams on arrival

Chun-Tsung Endowment — Peking University, 2015-2016
researched on the Erdős-Szemerédi problem supervised by Prof. Rongquan Feng

Undergraduate Young Talent Project in Pure Mathematics — Peking University, 2014-2017
mentored by Prof. Ruochuan Liu on algebraic number theory

Presentations

On the structure of anticyclotomic Selmer groups of modular forms — Ottawa, ON, Canada
Carleton–Ottawa Number Theory seminar — Nov 2025

On the structure of anticyc. Selmer groups of a supersingular elliptic curve — Ottawa, ON, Canada
Carleton–Ottawa Number Theory seminar — Nov 2025

On the arithmetic of Bernoulli–Hurwitz periods — Ottawa, ON, Canada
Carleton–Ottawa Number Theory seminar — Nov 2025

On the arithmetic of Bernoulli–Hurwitz periods — Beijing, China
Morningside Center of Mathematics, Chinese Academy of Sciences — Sept 2025

Explicit period formulas of the Bernoulli–Hurwitz measure — Kunming, China
Workshop on Frontiers in Number Theory, Tianyuan Mathematics Research Center — May 2025

On the structure of anticyclotomic Selmer groups of modular forms — Beijing, China
BIMSA-YMSC Tsinghua Number Theory Seminar — Apr 2025

On the structure of anticyclotomic Selmer groups of modular forms — Genova, Italy
Young researchers in Galois Representations and related topics — Jan 2025

On the structure of anticyclotomic Selmer groups of modular forms — Beijing, PRC
Morningside Center of Mathematics, Chinese Academy of Sciences — Oct 2024

Explicit differentiation of totally real p-adic Hecke L-functions — Beijing, China
Morningside Center of Mathematics, Chinese Academy of Sciences — Nov 2023

On the BDP Iwasawa main conjecture for modular forms — Baltimore, MD
Johns Hopkins Junior Number Theory Days 2022 — Dec 2022

Fourier transform according to Cartier — Piscataway, NJ
Rutgers Graduate Algebra and Representation Theory Seminar (GARTS) — Oct 2022

Explicit period formulas for totally real p-adic L-functions, à la Cassou-Noguès — Online
The Ohio State University Number Theory Seminar — Sept 2022

Explicit period formulas for totally real p-adic L-functions, à la Cassou-Noguès — Swarthmore, PA
Philadelphia Area Number Theory Seminar — Sept 2022

Construction of p-adic L-functions attached to modular forms via modular symbols — Online
Guest lecture for the graduate topic course MAT7395 of Université Laval — November 2021

Sum expressions for Kubota-Leopoldt p-adic L-functions — Online
Maine-Québec Number Theory Conference — October 2021

Teaching Experience

Teaching assistant — Peking University
Summer school in algebra and number theory — Summer 2025

Teaching assistant — Johns Hopkins University
AS.110.401 Introduction to Abstract Algebra — Fall 2022
AS.110.601 Algebra — Fall 2022
AS.110.202 Calculus III — Spring 2022
AS.110.202 Calculus III (online) — Fall 2021
AS.110.601 Algebra (online) — Fall 2021
AS.110.201 Linear Algebra (online) — Spring 2021
AS.110.413 Introduction to Topology (online) — Spring 2021
AS.110.106 Calculus I for Biology and Social Sciences (online) — Fall 2020
AS.110.411 Honors Algebra I (online) — Fall 2020
AS.110.405 Real Analysis I — Spring 2020
AS.110.445 Mathematical and Computational Foundations of Data Science — Spring 2020
AS.110.411 Honors Algebra I — Fall 2019
AS.110.422 Representation Theory — Fall 2019

Teaching assistant — Rutgers-New Brunswick
01:640:152 Calculus II for Mathematical and Physical Sciences — Spring 2019
01:640:151 Calculus I for Mathematical and Physical Sciences — Fall 2018

Peer Reviews

Referee for *Journal of Number Theory* (twice), *Research in Number Theory* and *Journal de Théorie des Nombres de Bordeaux* (ongoing).

Conferences Attended

Arithmetic cycles, modular forms and L-functions — Université de Montréal, Montréal, Canada, Aug 2025
Workshop on Frontiers in Number Theory — Tianyuan Math Research Center, Kunming, China, May 2025
Arizona Winter School 2025 — University of Arizona, Tuscon, AZ, Mar 2025
Young researchers in Galois Representations and related topics — Università di Genova, Genoa, Italy, Jan 2025
Arithmetic Geometry in Shenzhen — SUSTech, Shenzhen, China, Dec 2024
2024 Chen Jing-Run Prize Conference — Morningside Center of Mathematics, Beijing, China, Jul 2024
Development of Iwasawa theory (Kurihara60) — Keio University, Hiyoshi, Japan, Jul 2024
Special values of L-functions — TSIMF, Sanya, China, Jan 2024
JHU-UMD Algebra and Number Theory Day — Johns Hopkins, Baltimore, MD, Apr 2023

Shimura Varieties and L-Functions	MSRI/SLMath, Berkeley, CA, Mar 2023
Connections & Introductory Workshops: Algebraic Cycles, L-Values, and Euler Systems	MSRI/SLMath, Berkeley, CA, Jan 2023
Johns Hopkins Junior Number Theory Days 2022	Johns Hopkins, Baltimore, MD, Dec 2022
A Pair of Automorphic Workshops in 2022	University of Oregon, Eugene, OR, Jul 2022
2021 CMS Winter Meeting	Online, Dec 2021
Junior Number Theory Days	Johns Hopkins, Baltimore, MD, Dec 2021
Maine-Québec Number Theory Conference	Online, Oct 2021
Elliptic curves and the special values of L-functions	Online, ICTS, Aug 2021
JHU-UMD Algebra and Number Theory Day	University of Maryland, College Park, MD, Nov 2019
Sphericity 2019	CIRM, Luminy, France, Jan 2019
Sixth Abel Conference: A Mathematical Celebration of Robert P. Langlands	Minneapolis, MN, Nov 2018
Arithmetic algebraic geometry on the occasion of the 70th birthday of Rapoport	Bonn, Germany, Oct 2018
Connecticut Summer School in Number Theory	University of Connecticut, Storrs, CT, May-Jun 2018
Old and New themes in p-adic Cohomology	University of Arkansas, Fayetteville, AR, Apr 2018
Current Development in Mathematics	Harvard University, Cambridge, MA, Nov 2017

Services

Organizer of a learning seminar on characteristic classes	Rutgers, Spring 2019
Organizer of a student learning seminar on abelian varieties	Rutgers, Spring 2019
Co-organizer of a student learning seminar on linear algebraic groups	Rutgers, Fall 2018

Languages

English - proficient
Chinese - native
French - limited proficiency
Japanese - limited proficiency