Luochen ZHAO

Contact Information

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Education

Johns Hopkins University   Baltimore, MD, USA
Ph.D candidate in mathematics   Sept 2019 – Now
Thesis advisor: Antonio Lei   Department advisor: Yiannis Sakellaridis
Research area: Number theory, p-adic L-functions, p-adic Fourier transform

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

On the BDP Iwasawa main conjecture for modular forms
(with Antonio Lei) Preprint.
📄 https://arxiv.org/pdf/2211.04377.pdf.

Sum expressions for p-adic Hecke L-functions of totally real fields
Preprint, submitted to *Pure and Applied Mathematics Quarterly*.
📄 https://arxiv.org/pdf/2204.07364.pdf.

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.pdf.

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.pdf.

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

Presentation

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

Informal Talks

Outline of "Kolyvagin's work on modular elliptic curves" by Gross   Baltimore, MD
Johns Hopkins number theory learning seminar   Fall 2022

Deducing the Brumer-Strak conjecture from the main theorem   Online
Galois cohomology classes associated to modular forms   Online
ULaval learning seminar on the Brumer-Stark conjecture   Spring 2022

Generalities on the modular curve of level N   Online
ULaval learning seminar on Eisenstein ideals   Fall 2021

"Formal complex multiplication in local fields" by Lubin-Tate   Online
Johns Hopkins classic papers in number theory learning seminar   Spring 2021

"p-divisible groups" by Tate   Online
Johns Hopkins classic papers in number theory learning seminar   Fall 2020

Introduction to rigid analytic geometry   Baltimore, MD
JHU number theory learning seminar   Fall 2019

Structure theorem for reductive groups (absolute theory), I   Piscataway, NJ
Rutgers Graduate Algebra and Representation Theory Seminar (GARTS)   Spring 2019

Teaching Experience

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	Fall 2021
AS.110.601 Algebra	Fall 2021
AS.110.201 Linear Algebra	Spring 2021
AS.110.413 Introduction to Topology	Spring 2021
AS.110.106 Calculus I (Biology and Social Sciences)	Fall 2020
AS.110.411 Honors Algebra I	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

Conferences Attended

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

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