

# Luochen ZHAO

## CONTACT INFORMATION

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Citizenship: People's Republic of China

## EMPLOYMENT

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**Hebrew University of Jerusalem**  
Postdoctoral member under the ERC grant *Arithmetic of Curves and Jacobians*  
Mentor: Ari Shnidman

Jerusalem, Israel  
Sept 2023 – Aug 2024

## VISITING POSITIONS

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**Morningside Center of Mathematics**  
Visiting scholar  
Host: Xin Wan

Beijing, China  
Nov 2023 – Feb 2024

## EDUCATION

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**Johns Hopkins University**  
Ph.D in mathematics  
Thesis advisor: Antonio Lei      Department advisor: Yiannis Sakellaridis  
Research area: Number theory,  $p$ -adic  $L$ -functions, Iwasawa theory,  $p$ -adic analysis

Baltimore, MD, USA  
Sept 2019 – May 2023

**Rutgers, The State University of New Jersey**  
Ph.D candidate in mathematics

New Brunswick, NJ, USA  
Sept 2017 – Aug 2019

**Peking University**  
Bachelor of Science in mathematics  
Supervisor: Ruochuan Liu

Beijing, China  
Sept 2013 – Jul 2017

## PUBLICATIONS & PREPRINTS

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### On a product formula of bivariate $p$ -adic Gamma values

Preprint; submitted. 📄 <https://arxiv.org/pdf/2311.04805.pdf>.

### On the BDP Iwasawa main conjecture for modular forms

(with Antonio Lei) Published in *Manuscripta Mathematica*.

📄 <https://doi.org/10.1007/s00229-023-01485-4>; 📄 <https://arxiv.org/pdf/2211.04377.pdf>.

### 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.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

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<b>Professor Joel Dean Award</b> <i>for excellence in the teaching of mathematics</i>	Johns Hopkins, 2022
<b>Academic Excellence Award</b> <i>for passing written qualifying exams on arrival</i>	Rutgers, 2017
<b>Chun-Tsung Endowment</b> <i>researched on the Erdős-Szemerédi problem supervised by Prof. Rongquan Feng</i>	Peking University, 2015-2016
<b>Undergraduate Young Talent Project in Pure Mathematics</b> <i>mentored by Prof. Ruochuan Liu on algebraic number theory</i>	Peking University, 2014-2017

## PRESENTATIONS

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<b>Explicit differentiation of totally real <math>p</math>-adic Hecke <math>L</math>-functions</b> Lecture at the Morningside Center of Mathematics, Chinese Academy of Sciences	Beijing, China Nov 2023
<b>On the BDP Iwasawa main conjecture for modular forms</b> Johns Hopkins Junior Number Theory Days 2022	Baltimore, MD Dec 2022
<b>Fourier transform according to Cartier</b> Rutgers Graduate Algebra and Representation Theory Seminar (GARTS)	Piscataway, NJ Oct 2022
<b>Explicit period formulas for totally real <math>p</math>-adic <math>L</math>-functions, à la Cassou-Noguès</b> The Ohio State University Number Theory Seminar	Online Sept 2022
<b>Explicit period formulas for totally real <math>p</math>-adic <math>L</math>-functions, à la Cassou-Noguès</b> Philadelphia Area Number Theory Seminar	Swarthmore, PA Sept 2022
<b>Construction of <math>p</math>-adic <math>L</math>-functions attached to modular forms via modular symbols</b> Guest lecture for the graduate topic course <a href="#">MAT7395</a> of Université Laval	Online November 2021
<b>Sum expressions for Kubota-Leopoldt <math>p</math>-adic <math>L</math>-functions</b> Maine-Québec Number Theory Conference	Online October 2021

## INFORMAL TALKS

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<b>Arithmetic of Shimura curves</b> ULaval learning seminar on $p$ -adic uniformization of Shimura curves	Online Spring 2023
<b>Special fibre of Drinfeld's upper half plane</b> ULaval learning seminar on $p$ -adic uniformization of Shimura curves	Online Spring 2023
<b>Outline of "Kolyvagin's work on modular elliptic curves" by Gross</b> Johns Hopkins number theory learning seminar	Baltimore, MD Fall 2022
<b>Deducing the Brumer-Strak conjecture from the main theorem</b>	Online
<b>Galois cohomology classes associated to modular forms</b> ULaval learning seminar on the Brumer-Stark conjecture	Online Spring 2022
<b>Generalities on the modular curve of level <math>N</math></b> ULaval learning seminar on Eisenstein ideals	Online Fall 2021
<b>"Formal complex multiplication in local fields" by Lubin-Tate</b> Johns Hopkins classic papers in number theory learning seminar	Online Spring 2021
<b>"<math>p</math>-divisible groups" by Tate</b> Johns Hopkins classic papers in number theory learning seminar	Online Fall 2020
<b>Introduction to rigid analytic geometry</b> JHU number theory learning seminar	Baltimore, MD Fall 2019
<b>Structure theorem for reductive groups (absolute theory), I</b> Rutgers Graduate Algebra and Representation Theory Seminar (GARTS)	Piscataway, NJ Spring 2019

## TEACHING EXPERIENCE

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<b>Teaching assistant</b>	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
<b>Teaching assistant</b>	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

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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

## SERVICES

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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

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**English** - proficient

**Chinese** - native

**French** - limited proficiency

**Japanese** - limited proficiency