QIHANG LI

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EDUCATION

University of Maryland, College Park — *Aug 2019 - Present*
Ph.D Candidate in Mathematics (Advanced to Candidacy in *Dec 2021*) — College Park, MD, US
Advised by Prof. Thomas J. Haines (link)

Zhejiang University, Chu Kochen Honors College — *Sept 2015 - Jul 2019*
BS in Mathematics and Applied Mathematics (with honors) — Hangzhou, China
Minor in Japanese Language and Literature

RESEARCH INTERESTS

I do research in the Langlands Program and related subjects. My recent interest focuses on integral models and local models of Shimura varieties with deeper level structure and nearby cycles on them.

PAPERS

• **The test function conjecture for pro-p Iwahori local models of general linear groups and general symplectic groups**. (Available upon request; forthcoming on arXiv)
In this paper, I show that for pro-p Iwahori local models of GL_n and GSp_{2g}, nearby cycles give central functions in pro-p Iwahori Hecke algebra. Moreover, I describe these central functions explicitly in the Bernstein center. This paper gives the first proof of the test function conjecture for $\Gamma_1(p)$-level that works for general (not necessarily minuscule) cocharacters.

• **Local models and nearby cycles for $\Gamma_1(p)$-level structure**. (In preparation with Thomas J. Haines and Benoît Stroh; draft available upon request; forthcoming on arXiv)
In this paper, we construct and describe integral models and local models for Siegel modular varieties at $\Gamma_1(p)$-level. We show that functions attached to nearby cycles can be written as a sum of monodromic pieces and each monodromic piece is central. Moreover, in the minuscule case, we describe the functions explicitly in the Bernstein center and prove the centrality of these functions.

• **Compatibility of semisimple local Langlands parameters with parahoric Satake parameters**. manuscripta math. (2022). (Journal) (arXiv)
In this paper, I show that formal properties of semisimple local Langlands parameters constructed by Fargues and Scholze imply the uniqueness of the semisimple local Langlands correspondence for Iwahori-spherical representations, and this proves a conjecture of my advisor.

TALKS

Lie Groups and Representation Theory Seminar at UMD — 09/12/2022
• One hour seminar talk on my first published paper. Archives: (link)

PROFESSIONAL SERVICES

RIT("Research Interaction Team") on Stack of Langlands Parameters at UMD — Co-organizer
• Contributed 2 talks (out of 6) in the whole series

Proceedings of the American Mathematical Society — Referee

HONORS & AWARDS

Aziz Osborn Gold Medal in Teaching Excellence, UMD	2025
Ann G. Wylie Dissertation Fellowship, UMD	2025
Ralph P. Pass III Fellowship, UMD	2023
Summer Research Fellowship, UMD	2023
Hauptmann fellowship, UMD	2021, 2024
Dean's fellowship, UMD	2019, 2020
Prize of Zhajiang Province Government, ZJU	2017
1^{st} Prize of Excellent Undergraduate Scholarship, ZJU	2017, 2018

TEACHING

Elementary Calculus I, Calculus I, Introduction to Linear Algebra, Linear Algebra for Scientists and Engineers

• Leading discussion sessions (about 30 students per session and 2 sessions per semester) and holding office hours (2 hours per week) with good course evaluation feedback.

WORKSHOPS AND CONFERENCES ATTENDED

Summer School and Workshop on Relative Langlands Duality at UMN	2024
BIRS-CMO Workshop Langlands Program: Number Theory and Representation Theory (online)	2022
Arithmetic and Topology over global fields at UW Madison	2022
IHES Summer School on the Langlands program	2022
CMS Spring Sectional Meeting (online)	2021
UMD / JHU Algebra Number Theory Day, College Park / Baltimore, MD	2020-2024

SKILLS

Frameworks & Tools	Python, Numpy, TensorFlow, Java, C/C++, SQL, PySpark, LaTeX
Language	Mandarin, English, Japanese (JLPT N1 180/180), French (reading)