Hao Peng

Curriculum Vitae

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Education

2021 – now **Ph.D. candidate**, *MIT, Cambridge, MA.*
Advisor: Wei Zhang

2017 – 2021 **B.S. in Mathematics**, *Peking University, Beijing, China.*
Advisor: Ruochuan Liu

Research Interests

Selmer groups, Shimura varieties, and the Langlands program.

Preprints & Publications

[Pen25c] **Hao Peng**, *On the Beilinson–Bloch–Kato conjecture for polarized motives*, arXiv:2509.18615.

[Pen25b] **Hao Peng**, *The endoscopic character identity for even special orthogonal groups*, arXiv:2506.17907.

[Pen25a] **Hao Peng**, *Fargues-Scholze parameters and torsion vanishing for special orthogonal and unitary groups*, arXiv:2503.04623.

In Preparation

[1] **Hao Peng**, *An R=T theorem for certain orthogonal Shimura varieties.*

Invited Talks

Nov 2025 **RTG Seminar, UC Berkeley**, *"On the Beilinson–Bloch–Kato conjecture for polarized motives".*

Nov 2025 **Online Seminar run by D. Loeffler and S. Zerbes, UniDistance & ETH Zurich**, *"On the Beilinson–Bloch–Kato conjecture for polarized motives".*

Oct 2025 **NT/RT Seminar, UW–Madison**, *"On the Beilinson–Bloch–Kato conjecture for polarized motives".*

Sep 2025 **NT/RT Seminar, Boston College**, *"On the Beilinson–Bloch–Kato conjecture for polarized motives".*

Aug 2025 **Mini-course, BICMR, Peking University**, *"Arthur, Fargues–Scholze and Beilinson–Bloch–Kato".*

Jul 2025 **HO#T DAY WORKSHOP (Highly Original # Theory), IASM, Zhejiang University**, *"On the Beilinson–Bloch–Kato conjecture for polarized motives".*

Apr 2025 **Number Theory Seminar, Boston University**, *"Fargues–Scholze vs. classical parameters, and applications".*

Mar 2025 **Number Theory Seminar, Stanford**, *"Fargues–Scholze vs. classical parameters, and applications"*.

Mar 2025 **Lie Groups Seminar, MIT**, *"Fargues–Scholze vs. classical parameters, and applications"*.

Seminar Organizing

Fall 2025 **Co-organizer**, *Seminar on Topics in Arithmetic, Geometry, Etc. (STAGE)*.

Spring 2025 **Co-organizer**, *Learning seminar on recent high-profile papers*.

Fall 2024 **Co-organizer**, *Learning seminar on statement of arithmetic inner product formula*.

Jan 2024 **Organizer**, *Seminar on proof of local Langlands for* $\mathrm{GL}(n)$.

Awards and Honors

2022 Rogers Prize for best final paper of the 2022 Summer Program in Undergraduate Research of the Department of Mathematics, MIT, as a mentor.

2021 – 2022 Presidential Fellowship at MIT, an institute-wide honor.

2020 11^{th} session of S.T.Yau College Student Mathematics Contests, bronze medal in all-round contests, rank 4^{th} in China.

2020 11^{th} session of S.T.Yau College Student Mathematical Contests, bronze medal in algebra and number theory, rank 3^{rd} in China.

2019-2020 National Scholarship (China), Ministry of Education of China — national undergraduate merit scholarship.

Teaching Experience

Fall 2024 **Recitation Instructor**, *18.03: Differential Equations*.

2024 – 2025 **PRIMES mentor**, *"Analytic number theory" (Iwaniec & Kowalski)*, year-long analytic number theory reading program for three high school students, PRIMES.

Jan 2024 **DRP mentor**, *'Local Langlands correspondence for* $\mathrm{GL}(n)$ *over p-adic fields by P. Scholze*, directed reading program for one undergraduate student.

Aug 2022 **SPUR mentor**, *"Density of Tamagawa numbers of elliptic curves over global fields"*, research paper by one undergraduate student, (SPUR, MIT).

Aug 2022 **SPUR mentor**, *"Gelfand–Kirillov dimensions of representations of p-adic groups"*, research paper by one undergraduate student, summer program in undergraduate research (SPUR, MIT).

Jan 2022 **DRP mentor**, *"A first course on modular forms" by F. Diamond and J. Shurman*, directed reading program for two undergraduates.

Expository Writings

Skyscraper Project. This evolving project collects my expository notes.