

Hao Peng

Curriculum Vitae

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Employment

2026 – now **Instructor**, Princeton University, Princeton, NJ.

Education

2021 – 2026 **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](#).

[P-W26] **Hao Peng and Dmitri Whitmore**, *An $R=T$ theorem for certain orthogonal Shimura varieties*, [arXiv:2503.04623](#).

In Preparation

[Pen26] **Hao Peng**, *On the Beilinson–Bloch–Kato conjecture for polarized motives. II. Self-dual case*.

Invited Talks

Sep 2026 **Automorphic forms and representation theory seminar, Purdue University**, “Endoscopy and local Langlands correspondence for $SO(2n)$ ”.

Jun 2026 **Algebra and Number Theory Forum, Sichuan University**, “The Beilinson–Bloch–Kato conjecture and theta correspondence”.

Jan 2026 **Junior Number Theory Day, John Hopkins University**, “An $R=T$ theorem for certain orthogonal Shimura varieties”.

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 2026 **Co-organizer**, *Joint PU/IAS Number Theory*.
- 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 $GL(n)$* .

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 11th session of S.T.Yau College Student Mathematics Contests, bronze medal in all-round contests, rank 4th in China.
- 2020 11th session of S.T.Yau College Student Mathematical Contests, bronze medal in algebra and number theory, rank 3rd in China.
- 2019-2020 National Scholarship (China), Ministry of Education of China — national undergraduate merit scholarship.

Teaching

- Fall 2026 **Instructor**, *MAT103: Calculus I*.
- 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 $GL(n)$ 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.