Email: sempjack@gmail.com

Jack Wood Sempliner

Education

Princeton University — Princeton, NJ
Ph.D. in Mathematics, Advisor: Richard Taylor — 2016–2025 (Expected March 2025)

Princeton University — Princeton, NJ
M.A. in Mathematics — 2016–2017

University of Chicago — Chicago, IL
B.A. in Mathematics — 2012–2016

Experience

Princeton University — Princeton, NJ
Graduate Student in Mathematics — 2016–2021

- Organized, participated in, and co–organized several department seminars and graduate student seminars on topics relating to arithmetic geometry and number theory.

Stanford University — Stanford, CA
Visiting Scholar — September 2018 –February 2019, January 2020–March 2020

- Visited at Stanford University to meet in person with my advisor. While there I participated in several department seminars on topics in arithmetic geometry, representation theory, and number theory.

Imperial College London — London, UK
Research Associate in Number Theory — October 2021 –October 2024

- Research: Postdoc in number theory, supervised by professor Toby Gee.

Papers/Preprints

[1] J. Sempliner, *On uniformization of moduli stacks of shtuka and exotic isomorphisms of igusa varieties (princeton phd thesis)*, 2025.

[2] P. van Hoften and J. Sempliner, *On exotic hecke correspondences*, in the final stages of preparation, 2024.

[3] P. van Hoften and J. Sempliner, *On the piatetski-shapiro construction for integral models of shimura varieties*, *submitted*, 2024. arXiv: 2403.10653 [math.NT].

[4] J. Sempliner and R. Taylor, *Cocycles for kottwitz cohomology*, *submitted*, 2024. arXiv: 2407.06031 [math.NT].

[5] J. Sempliner and R. Taylor, *On the formalism of shimura varieties*, preprint available online at https://virtualmath1.stanford.edu/ rltaylor/shim2.pdf, *submitted*, 2024.

Selected Talks

- On Igusa Varieties for Moduli of Bounded Global G-Shtuka, Berkeley Number Theory Seminar — Fall 2021
- On Exceptional Isomorphisms Between Igusa Varieties, London Number Theory Seminar — Fall 2021

- On Exceptional Isomorphisms Between Igusa Varieties over function fields, Cambridge Number Theory Seminar Spring 2022
- On the Formalism of Shimura Varieties, Queen Mary University Number Theory Seminar Spring 2022
- On cohomological Jacquet-Langlands for Shimura varieties, University of Manchester Number Theory Seminar Fall 2024

Teaching

- **Instructor** at Princeton University Fall 2019
  Linear Algebra
- **Teaching Assistant** at Princeton University Spring 2019
  Honors Linear Algebra
- **Course Lead** at Imperial College London Fall 2023
  Number Theory

Skills

- **Mathematical Software:** Working proficiency with SAGE and MAGMA.
- **Programming:** Proficiency in Java, C, Python, Haskell, Javascript.

Languages

- **English:** Native speaker.
- **French:** Working proficiency.
- **Italian:** B2 Proficiency
- **Swedish:** B1 Proficiency

Scholarships and Awards

- NSF Graduate Research Fellowship 2016–2021
- First Year Fellowship, Princeton University 2016–2017
- Paul R. Cohen Memorial Prize, University of Chicago 2016

Conferences/Workshops Attended

- Connecticut Summer School in Number Theory Summer 2016
- Arizona Winter School: Perfectoid Spaces March 11–15, 2017
- Barry Charles Mazur: 80th Birthday Conference Summer 2018
- Ofer Gabber: 60th Birthday Conference Summer 2018
- Padova school on Serre conjectures and the p-adic Langlands program Summer 2018
- Arithmetic Geometry in Carthage Summer 2018
- Geometric realizations of Jacquet-Langlands correspondences, AIM Fall 2019

- Summer School on the Langlands program, IHES July 2022
- Iwasawa 2023: in memory of John Coates, Cambridge July 2023
- Arithmetic of automorphic forms, in honor of Laurent Clozel, Paris Saclay September 2023
- Arithmetic Geometry - A Conference in Honor of Hélène Esnault on the Occasion of Her 70th Birthday, IHES April 2024
- Modular Forms, L-functions, and Eigenvarieties, in memoriam for Joël Bellaiche, ENS Paris June 2024
- Conference on "Arithmetic Geometry" in Honour of Gerd Faltings' 70th Birthday, Bonn July 2024
- New Advances in the Langlands Program: Geometry and Arithmetic, Oxford October 2024

Mentoring

- **Mentoring Moebius Program**
  - Mentored a small group of mathematically inclined undergraduate students once per week as part of Princeton University's mentoring Moebius program. Discussions ranged from concrete topics in mathematics to applying to graduate school.
- **Princeton DRP**
  - Co–founded and was an inaugural participant in the Princeton DRP program. Directed mathematically talented undergraduates in researching a chosen mathematical area.
- **Imperial College Graduate Program**
- Supervised masters students Additi Pandey and Alberto Centelles. Additi Pandey's project focused on class field theory and genus theory, whereas Alberto Centelles' project was on Mazur's torsion theorem and the geometry of modular curves.