

YANG HU

Curriculum Vitae

yanghumath2004@outlook.com

Homepage: huyang16.github.io

EDUCATION

University of Minnesota Twin Cities Spring 2026–present

University of California, Berkeley Fall 2025
BISP Program.

Southern University of Science and Technology Fall 2023–present

RESEARCH INTERESTS

Representation theory, number theory, and arithmetic geometry. Particular interests include representations of finite and p -adic groups, the Weil representation, the finite-field Howe correspondence, and the arithmetic of abelian varieties.

RESEARCH EXPERIENCE

Oscillator semigroups over finite fields 2026–present

Research with Prof. Dihua Jiang, University of Minnesota.

- Investigating irreducible representations of centralizers in Howe’s oscillator semigroups and their restrictions to the classical groups occurring in reductive dual pairs.
- Using finite semigroup representation theory to relate irreducible semigroup modules to representations of local groups, and studying how this description can be used in explicit restriction calculations.
- Developing branching calculations for general linear dual pairs through Harish-Chandra induction, Zelevinsky’s parametrization, and Pieri rules. Studying the orthogonal–symplectic case using Harish-Chandra theory and Hecke algebras.
- Exploring explicit connections between irreducible representations of oscillator semigroups and the Howe correspondence over finite fields.

READING

Algebraic geometry Fall 2024

Directed reading with Prof. Yifei Zhu, Southern University of Science and Technology.

Representations of p -adic groups Winter 2025

Directed reading with Prof. Baiying Liu, Purdue University.

Automorphic representations of GL_2 and the Weil representation 2026

With Prof. Dihua Jiang, University of Minnesota.

- Studied representations of GL_2 and SL_2 , including Kirillov and Whittaker models and character calculations.
- Prepared expository notes and explicit computations on the Heisenberg group, the Schrödinger model, and the construction of the Weil representation.
- Examined the passage from projective representations to metaplectic extensions, including cocycles and their normalization in explicit formulas.

p -Adic Hodge theory Fall 2025

Berkeley Directed Reading Program; mentor: CJ Dowd.

- Read introductory material from Brinon–Conrad on Fontaine’s period rings and their relation to p -adic Galois representations, emphasizing the de Rham and crystalline constructions.
- Studied Witt vectors and perfection, A_{inf} and Fontaine’s map, Hodge–Tate and de Rham representations, and associated filtered and semilinear structures.

Oscillator semigroups over finite fields: irreducible representations and restrictions. Manuscript in preparation, 2026.

SELECTED EXPOSITORY WRITING AND COURSE NOTES

Abelian varieties over finite fields

Expository notes based on Prof. Ananth Shankar’s lectures at the Northwestern Arithmetic and Algebraic Geometry Bootcamp, 2026. These notes introduce the basic theory of abelian varieties over finite fields, with an emphasis on CM abelian varieties and Grothendieck–Messing deformation theory.

The Weil representation over local fields

Expository notes developed through directed reading with Prof. Dihua Jiang. These notes discuss the Heisenberg group and Schrödinger model, the construction of the Weil representation, and metaplectic extensions, with explicit computations of operators and cocycles.

Abelian varieties and their moduli

Course notes associated with Prof. Kai-Wen Lan’s graduate course at the University of Minnesota.

On Galois representations

Term paper for Number Theory (MATH 254A) at the University of California, Berkeley, under the guidance of Prof. Sug Woo Shin, Fall 2025.

p -Adic Hodge theory

Final report for the Berkeley Directed Reading Program, December 2025. This report introduces period rings, Hodge–Tate and de Rham representations, and their relationship with filtered and semilinear objects. Listed on the Berkeley DRP’s Fall 2025 project page.

SELECTED GRADUATE COURSEWORK

Algebraic Geometry; Algebraic Number Theory; Algebraic Topology; Lie Groups and Lie Algebras; Real Analysis; Abelian Varieties and Their Moduli; Representation Theory of Finite Groups; Representations of p -adic Groups; Topics in Representation Theory; Abstract Algebra.

SEMINARS, CONFERENCES, AND SUMMER SCHOOLS

Arithmetic and Algebraic Geometry Bootcamp August 17–21, 2026
Participant, Northwestern University, Evanston, Illinois.

Summer Workshop on Character Sheaves on Loop Groups June 8–12, 2026
Participant, University of Minnesota Twin Cities, Minneapolis, Minnesota.

CAS Summer School 2025
Participant, Peking University.
Attended lectures on algebraic geometry, number theory, and representation theory.

Learning Seminar on Fourier Analysis Fall 2024
Presenter, Southern University of Science and Technology.
Presented Chapter 5 of Stein’s *Fourier Analysis: An Introduction*.

LANGUAGE TEST

TOEFL iBT: 107/120. Reading: 29; Listening: 30; Speaking: 24; Writing: 24.