Asvin G.

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Last updated: October 27, 2025

Positions

2025-2026 **Postdoc**, *Institute for Advanced Study, Princeton*, Advisor: Jacob Tsimerman.

2025 Spring Semester **Postdoc**, *University of Toronto*, Advisor: Jacob Tsimerman.

2024 Fall Semester **Postdoc**, *Mathematics of Intelligence at IPAM, UCLA*.

2023-2024 **Postdoc**, *Hebrew University of Jerusalem*, Advisor: Ari Shnidman.

Education

2018-2023 **PhD**, *University of Wisconsin-Madison*, Advisor: Jordan Ellenberg.

2015–2017 **MMath**, *University of Michigan, Ann Arbor*.

2011-2015 **BS with Distinction**, *Indian Institute of Technology Kanpur*.

Skills

Expert in: Mathematics - in particular, algebraic geometry, number theory, category theory and combinatorics.
Fluent in: Physics, in particular statistical mechanics, theory of computation, programming (Python, Sage, Lean), Machine Learning research, Cognitive Science.

Interests

Machine learning, cognitive science, theory of intelligent agents, evolutionary biology, Arithmetic geometry.

Papers

1. A Chebotarev Density Theorem over Local Fields; joint with Yifan Wei and John Yin.[arxiv]
2. Configuration spaces, graded spaces, and polysymmetric functions; joint with Andrew O'Desky. [arxiv] (*submitted*)
3. On the variation of the Frobenius in a non abelian Iwasawa tower. [arxiv] (*Algebra and Number Theory*)
4. Unlikely and just-likely intersections for high dimensional families of elliptic curves. [arxiv] (*submitted*)
5. Just-likely intersections on Hilbert modular surfaces; joint with Qiao He and Ananth N. Shankar. [arxiv] (*Math. Annalen*)
6. Supersingularity of Motives with Complex Multiplication and a Twisted Polarization. [arxiv]

Awards

1. *Excellence in Research, Graduate Student Award*, 2021.
2. *Henry Schaerf Mathematics Graduate Award*, 2022.

Research Talks

1. (May 2023) *Hebrew University of Jerusalem.* A Chebotarev Density Theorem over Local Fields.
2. (May 2023) *Brown University.* A Chebotarev Density Theorem over Local Fields.
3. (Jan 2023) *JMM, Special Session - Excursions in Arithmetic Geometry.* Just-likely and unlikely intersections on Shimura varieties.
4. (Dec 2022) *John Hopkins Junior Number Theory Days 2022.* On a p-adic Chebotarev density theorem.
5. (May 19, 2022) *IISC Number Theory seminar, Bangalore.* On the space of irreducible polynomials in many variables.
6. (April 30, 2022) *ADDING seminar, Georgia.* The variation of Frobenius eigenvalues in ℓ-adic towers of curves over a finite field.
7. (Nov 22, 2021) *UW Madison Singularities seminar.* On topological invariants of the space of irreducible polynomials in many variables.
8. (Oct 22, 2021) *UW-Madison Algebraic Geometry seminar.* A generalization of the ring of Symmetric functions and an application to computing topological invariants of graded monoid spaces.
9. (Oct 14, 2021) *UW-Madison Number Theory seminar.* The variation of the characteristic polynomial in ℓ-adic towers.

Expository Talks and Reading Groups

1. (July 28, 2017) *Invited talk at TIFR*. On mod-p and p-adic modular forms following Swinnerton-Dyer and Serre.
2. (Spring 2018-2019) *For a course on Class Field Theory.* On Drinfeld Modules.
3. (Spring 2018 - Fall 2019) *Math-Physics reading group, UW Madison.* Covered various topics such as Quantum cryptography, electromagnetism, statistical physics etc.
4. (Nov 10, 2020) *Minnesota reading seminar on perfectoid spaces.* On the Weight-Monodromy Conjecture.
5. (Feb 7, 2021) *U-Washington reading seminar*. On Mori's paper "Projective manifolds with ample tangent bundle."
6. (Winter 2020-21) *Reading group on Weil I.*
7. (Summer 2021) *Reading group on Absolute Hodge Cycles.*
8. (Summer 2021) *Reading group on p-adic Hodge Theory.*
9. Various talks in the Graduate Number Theory and Algebraic Geometry seminars at UW-Madison.

Teaching

1. (Fall Semester, 2018-19) *Teaching Assistant; Math 221, UW-Madison*: Calculus I.
2. (Fall Semester, 2018-19) *Directed Reading Program for undergraduates, UW-Madison*: Algebraic Geometry and Galois Theory.
3. (Spring Semester, 2018-19) *Teaching Assistant; Math 222, UW-Madison*: Calculus II.
4. (Spring Semester, 2018-19) *Directed Reading Program for undergraduates, UW-Madison*: Algebraic Number Theory.

5. (Fall Semester, 2019-20) *Teaching Assistant; Math 234, UW-Madison*: Calculus III.
6. (Spring Semester, 2019-20) *Teaching Assistant; Math 240, UW-Madison*: Discrete Math.
7. (Spring Semester, 2019-20) *Directed Reading Program for undergraduates, UW-Madison*: Galois Theory.
8. (Summer Semester, 2019-20) *Instructor; Math 234, UW Madison*: Calculus III.
9. (Fall Semester, 2020-21) *Teaching Assistant; Math 340, UW-Madison*: Linear Algebra
10. (Spring Semester, 2020-21) *Instructor; Math 96, UW Madison*: Preparatory Algebra.
11. (Fall Semester, 2021-22) *Teaching Assistant; Math 321, UW-Madison*: Applied Mathematical Analysis.
12. (Spring Semester, 2021-22) *Teaching Assistant; Math 321, UW-Madison*: Applied Mathematical Analysis.