Akash Narayanan

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Education

University of Notre Dame — Fall 2025 - Current

- Ph.D in Mathematics.

Georgia Institute of Technology — Fall 2021 - December 2024

- B.S. in Mathematics. 3.96 GPA. Highest honors.

Publications and Preprints

1. **Geodesic-preserving bijections of the Thurston geometries.** (joint with Ryan Dickmann and Palani Lideros). In preparation.

Undergraduate Research

University of Chicago REU — June 2024 - August 2024

- Studied the Weil-Petersson metric on Teichmüller space and Wolpert's solution to the Nielsen realization problem.

- Worked with Elizaveta Shuvaeva.

Georgia Tech CUBE REU — May 2023 - July 2023

- Studied geodesic-preserving bijections of various spaces, including the Thurston geometries.

- Worked with Dr. Dan Margalit, Dr. Ryan Dickmann, and Palani Lideros.

Undergraduate Research — August 2022 - May 2023

- Computed presentations of finite-index subgroups of braid groups via the Reidemeister-Schreier method.

- Worked with Dr. Wade Bloomquist and Alice Ponte.

Talks

10. *The Lefschetz Hyperplane Theorem.* Notre Dame Graduate Student Topology Seminar, September 2025.

9. *An Introduction to Spectral Sequences.* Georgia Tech Algebra Student Seminar, February 2025.

8. *The Pontryagin-Thom Construction.* Georgia Tech Geometry Topology Student Seminar, February 2025.

7. *Hamilton's Ricci Flow on Surfaces.* Georgia Tech Geometry Reading Seminar, November 2024.

6. *Indigenous Bundles and Uniformization.* Georgia Tech Geometry Topology Student Seminar, November 2024.

5. *Cohomology and Euler Characteristics of Groups.* Georgia Tech Algebra Student Seminar, September 2024.

4. *Three Perspectives on B_3.* Georgia Tech Geometry Topology Student Seminar, January 2024.

3. *An Introduction to Morse Theory.* Georgia Tech Geometry Topology Student Seminar, September 2023.

2. *Groups, Extensions, and Cohomology.* Georgia Tech Algebra Student Seminar, February 2023.

1. *Braided Monoidal Categories and Fusion Categories.* Georgia Tech Algebra Student Seminar, February 2022.

Reading Group and Seminar Involvement

Seminars

- (1 talk) Co-organizer of the first year graduate student seminar at Notre Dame (Fall 2025-Spring 2026).

- (2 talks) Participant in reading group on Atiyah-Bott's "The Yang-Mills equation over Riemann Surfaces" (Spring 2025).

- (2 talks) Co-organizer of *Moduli of Curves @ GT*, with Aidan Latona. Reading on the moduli space of curves, loosely following Harris and Morrison's *Moduli of Curves* (Fall 2024).

- (2 talks) Participant in reading group organized by Alex Nolte on some of Thurston's work (Flat Cone Metrics and Triangulations of the Sphere, Zippers and Univalent Functions, Rodin-Sullivan's Circle Packing Theorem) (Fall 2023-Spring 2024).

Directed Reading Program

- Dynamics on homogeneous spaces following Benoist-Quint. Advised by Alex Nolte. Spring 2025.

- Surgery theory following Milnor's *Lectures on the h-cobordism theorem* and Kervaire-Milnor's *Groups of homotopy spheres: I.* Advised by Sean Eli. Fall 2024.

- Riemann surfaces and Teichmüller theory following Bers' *Quasiconformal Mappings and Teichmüller's Theorem.* Advised by Alex Nolte. Spring 2024.

- Characteristic classes and K-theory. Advised by Sean Eli. Fall 2023.

- Category theory following Riehl's *Category Theory in Context.* Advised by Griffin Edwards, joint with Matthew Sumanen. Spring 2023.

- Group cohomology following Brown's *Cohomology of Groups.* Advised by Dan Minahan. Fall 2022.

- Algebraic number theory following Marcus' *Number Fields.* Advised by Eric Zhu, joint with Toyesh Jayaswal. Summer 2022.

- Lie groups following Fulton and Harris' *Representation Theory: A First Course.* Advised by Dan Minahan, joint with Noah Caplinger. Spring 2022.

- Representation theory of finite groups. Advised by Dr. Wade Bloomquist. Fall 2021.

Teaching Experience

- Grader, MATH 3012 - Applied Combinatorics (Fall 2021).

Outreach

- Georgia Tech High School Math Day volunteer (March 2023).

Awards and Scholarships

- Arthur J. Schmitt Presidential Leadership Fellowship, 2025-2030

- Zell Miller Scholarship, 2021-2024

Relevant Skills

- Programming Languages: GAP, Python, Java, LaTeX.