

AKASH NARAYANAN

Department of Mathematics
University of Notre Dame
B02 Hayes-Healy

anaraya2@nd.edu
<https://akash-narayanan-math.github.io>

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 INVOLVEMENT

Seminars

- (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, L^AT_EX.