

ANTHONY DENDER

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Citizenship: United States and Croatia

Baltimore, MD 21212

EDUCATION

New York University, New York, NY

2021-2025

- Honors Major in Mathematics, Major in French, Minor in Computer Science; anticipated in Spring 2025
- GPA: 3.88; Mathematics Major GPA: 3.920
- Presidential Honors Scholar at the College of Arts and Sciences
- Studied at NYU Paris and Paris Cité University for the Spring 2024 semester
- **Relevant Coursework:** Real Analysis, Complex Analysis, Abstract Algebra, Differential Geometry, Algebraic Topology, Fourier Analysis, Analytic Number Theory, Spectral Theory, Quantum Mechanics
- **Coursework outside of NYU:** Intermediate Electrodynamics at Goucher College, Differential Geometry at Paris Cité University

The Park School of Baltimore, Baltimore, MD

Graduated 2021

EMPLOYMENT HISTORY

Grader, Differential Geometry and Topology

January-May 2025

New York University

- Course grader for the Differential Geometry (MATH-UA 377) and Topology (MATH-UA 375) undergraduate courses at New York University.

Transformational Computing Intern, Device Theory Team

Northrop Grumman Corporation

June-August 2023

- Used representation and operator theory to increase the capabilities of simulations of quantum circuit elements. Worked in particular with operator representations of various matrix Lie algebras.

Transformational Computing Intern

Northrop Grumman Corporation

June-August 2022

- Worked on developing meshing algorithms for 3D modeling of superconducting electronics.
- Implemented a system for streamlining the process of displaying 3D models of chip data.

Teaching Assistant

Johns Hopkins Engineering Innovation

June-August 2021

- Worked with the instructor and assistant instructor to plan classes, help students, and grade assignments.
- Topics taught included physics, programming, statics, basic statistics, and chemistry, among others, with a general focus on applications to engineering.

SURE (Summer Undergraduate Research Experience) Grant Recipient *Summer 2024 - Present*

I received a grant to participate in NYU's summer research program for undergraduates. My work involved extending the results of a paper by Gerald Beer and Efe Ok on the topic of the existence of topological order-embeddings of topological posets into their hyperspaces. I focused on embeddings using non-canonical maps, and proved affirmative results for discrete topological spaces under arbitrary order, and for certain well-behaved subsets of metrizable topological vector spaces.

Algebraic Geometry Seminar (Hodge Theory) *Fall 2024 - Present*

I am participating in a small student seminar covering Hodge theory, following the text *Hodge Theory and Complex Algebraic Geometry I* by Claire Voisin. The seminar is currently focused on proving and elucidating results in the setting of complex and Kähler manifolds such as Poincaré duality, the Hodge decomposition, and the Lefschetz decomposition.

Algebraic Geometry Seminar (Varieties) *Fall 2023*

I participated in a small student seminar on classical algebraic geometry, following the text *Basic Algebraic Geometry 1: Varieties in Projective Space* by Igor Shafarevich. The seminar focused on fundamental concepts involving affine and projective varieties over an algebraically closed field, and concluded with a proof of the Riemann-Roch theorem on curves. During problem-solving sessions, I met frequently with a graduate student in order to begin becoming familiar with scheme-theoretic algebraic geometry, a domain not covered in the main seminar.

Dean's Undergraduate Research Fund Recipient *Fall 2023*

I received a grant from my university to participate in research in computer science. The funding was specifically for a paper entitled *Review and Analysis of Choice of Neighborhood Topology in Particle Swarm Optimization*, which will summarize the previous literature on, and test the performance of, various adaptive network topologies when applied to the particle swarm optimization algorithm. Work was presented at NYU's Undergraduate Research Conference.

Optimal Transport Seminar *Spring 2023*

I worked with a small group of mathematics PhD students and advanced undergraduates in an independent reading group/seminar on the topic of Optimal Transport. The goal of the seminar was to read, discuss, and present about Cédric Villani's text "Topics in Optimal Transportation". The topics involved included Riemannian geometry, functional analysis, and measure theory.

International Student-led Arctic Monitoring and Research (ISAMR)

Data Analysis Team Leader *2017 - 2021*

ISAMR is a high school research group that gathers field data annually from the Arctic to determine and extrapolate climate trends. Data collected ranges from permafrost thickness, microbial activity and DNA profile to polar bear observation and activity analysis. I was the leader of the Data Analysis Group, which is responsible for modeling, trend analysis, and graphical presentation of our data in scientific reports produced annually.

HONORS / AWARDS

- Dean's List for the 2021-2022, 2022-2023, and 2023-2024 academic years
- Dean's Undergraduate Research Fund (DURF) grant recipient (2023)
- Summer Undergraduate Research Experience (SURE) grant recipient (2024)
- Department of French Literature, Thought and Culture French Award (2023-2024)
- Member of the New York University chapter of Pi Delta Phi, the National French Honor Society

ADDITIONAL SKILLS

- Proficiency in LaTeX
- Intermediate knowledge of Python and Java
- Basic knowledge of MATLAB, Lean, and R
- Professional working proficiency in French