

Analisa Faulkner Valiente

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EDUCATION

Barnard College at Columbia University

B.A. in Mathematics

New York, NY

Expected May 2026

4.06/4.00 GPA, Dean's List

Relevant coursework: Honors Math A & B, Modern Algebra 1 & 2, Modern Analysis, Topology, Differentiable Manifolds, Algebraic Number Theory, Commutative Algebra (graduate course), Algebraic Topology I (graduate course), Algebraic Number Theory (graduate course), Algebraic Topology II (graduate course) Analysis and Probability I (graduate course)

Spring 2026: Arithmetic & Algebraic Geometry (graduate course)

Montclair High School

High School Diploma

Montclair, NJ

June 2022

4.49/4.00 GPA

RESEARCH EXPERIENCE

Mathematics Department, Columbia University

Researcher

New York, NY

05/2025 - 09/2026

- Research with Professor Andrew Blumberg on the homotopy type of Sobolev spaces, leading to a senior thesis.

Department of Mathematics and Statistics, University of Vermont

Researcher

Burlington, VT

05/2024 - 08/2024

- Collaborating with Professor Michael Miller Eismeier in studying monopole Floer homology and developing a Lefschetz decomposition over \mathbb{Z} to be used in computing $\overline{HM}(S^1 \times \Sigma_g)$.

Mathematics Department, Columbia University

Researcher

New York, NY

05/2024 - 08/2024

- Guided reading with Professor Michael Harris in the theory of algebraic curves and Deligne-Lusztig theory.

Mathematics Department, Columbia University

Researcher

New York, NY

09/2023 - 05/2024

- Collaborating with Professor Gyujin Oh in studying unimodal lattices within cyclotomic field extensions

Mathematics Department, Columbia University & Barnard Summer Research Institute

Researcher

New York, NY

05/2023 - 08/2023

- Worked under Professor Gyujin Oh to study modular forms and their role in Maryna Viazovska's solution to the sphere packing problem in 8 dimensions.

TEACHING & LEADERSHIP EXPERIENCE

Columbia Journal of Undergraduate Mathematics

Co-Founder and Editor-In-Chief

New York, NY

07/2023 - Present

- * Founded an undergraduate expository mathematics journal in recognition of a lack of publications sharing such work.
- * Recruited an 40-person undergraduate editorial board, graduate student and faculty reviewers, and faculty sponsors (Professor Francesco Lin and Professor George Dragomir)
- * Coordinated recruitment and publicity events with the Columbia mathematics department
- * Read and wrote referee reports for expository articles submitted to the journal
- * Most recent issue published in September of 2025

Mathematics Department, Columbia University

Teaching Assistant

New York, NY

09/2023 - present

- * Hold office hours, grade homework, organize and run review sessions, provide solutions to problem sets and lists of general feedback, answer student questions over email.

Undergraduate Mathematics Society, Columbia University

New York, NY

President

06/2024 - 05/2025

- * Organizing a weekly lecture series for undergraduates with a social dinner beforehand
- * Organizing and facilitating the UMS summer learning seminar on Zoom
- * Advising undergraduates on mathematical speaking
- * Acting as a liaison between the math department administration and faculty and the undergraduate community

Teaching Assistant

07/2023 - present

- * Lectured to and guided problem-solving for students in the course Introduction to Mathematical Proofs in order to prepare students for proof based courses
- * Coordinated and lectured for a summer learning seminar designed to supplement the Columbia mathematics curriculum
- * Redesigning the course notes for Introduction to Mathematical Proofs

Programming Coordinator

01/2023 - 05/2024

- * Organizing social and informational events for the Undergraduate Math Society such as a movie night and a course planning panel
- * Designed and shared publicity material for talks and events

AWARDS & HONORS

Goldwater Scholarship

05/2024

- * The Goldwater Scholarship Fund awards this prize to students across the nation in science, math, and engineering that demonstrate exceptional research ability.

Margaret Kenney Jensen Prize for Mathematics at Barnard College

04/2024

- The mathematics department at Barnard College nominates a student for this prize in recognition of excellence in mathematics.

Dr. Barnett and Jean Hollander Rich Fund for the Study of Mathematics at Barnard College

11/2023

- Barnard College awards this scholarship to a Barnard student in recognition of outstanding performance in mathematical studies.

CONFERENCES AND WORKSHOPS

Low-Dimensional and Floer theory

Workshop

Centre de Recherches Mathématiques

08/2025

Simons Collaboration Satellite Conference

Conference

Princeton

03/2025

Joint Mathematics Meeting

Conference

Seattle

01/2025

AWM Women+ and Mathematics

Workshop

Princeton

05/2024

Joint Mathematics Meeting

Conference

San Francisco

01/2024

TALKS & PRESENTATIONS

"Reshetikin-Turaev Invariants"	Talk
Columbia University Graduate Quantum Link Invariants Seminar	09/2025
"Quantitative Homotopy Theory and the Homotopy Type of Sobolev Spaces"	Poster
Barnard College Summer Research Institute Linda Orzeck '68 Poster Session	08/2025
"Zeta Functions"	Talk
Columbia University Graduate Abelian Varieties Seminar	03/2025
"Joyal Equivalences"	Talk
Columbia University Graduate ∞ -Categories Seminar	02/2025
"Heegaard Floer homology over the integers"	Talk
Joint Mathematics Meeting	01/2025
"Extended Cup Homology of $S^1 \times \Sigma_g$"	Talk
Undergraduate Mathematics Society Weekly Lecture Series	10/2024
"The Drinfeld Curve"	Talk
Columbia University Graduate Deligne-Lusztig Theory Seminar	10/2024
"Introduction to Representation Theory"	Talk
Undergraduate Mathematics Society Summer Learning Seminar	07/2024
"Sphere Packing in 8 Dimensions"	Talk
Undergraduate Mathematics Society Weekly Lecture Series	09/2023
"Modular Forms and Sphere Packings"	Poster
Barnard College Summer Research Institute Linda Orzeck '68 Poster Session	08/2023
"Exterior Products and Area"	Talk
Undergraduate Mathematics Society Summer Learning Seminar	08/2023
"Rational Points on Elliptic Curves"	Talk
Columbia Mathematics Department Directed Reading Program Final Presentations	04/2023

PAPERS

"A Lefschetz decomposition over \mathbb{Z} and an application to Heegaard Floer homology"	arxiv:2507.00844
with Mike Miller Eismeier; preprint, submitted for publication	