ZACHARY BERENS

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EDUCATION

Mathematics (B.S.) Duke University (Durham, NC) August 2021 - May 2025
GPA: 3.975
Activities: Duke Undergraduate Math Seminar (Founder and President), Duke University Math Union
Concurrent Enrollment University of Utah (SLC, UT) August 2020 - May 2021
GPA: 4.000

AWARDS

University Scholars Program Scholarship Duke University August 2021 - May 2025
Full-ride merit scholarship awarded to students with a strong interest in interdisciplinary research, collaborative thinking, and innovative academic pursuits. I was one of five students in the Class of 2025 who received the scholarship.

SELECT MATH COURSES

Fall 2024 Automorphic Representation Theory (†), Reconstructing Perfect Schemes (IS), The Geometry of String Theory (IS)
Fall 2023 - Spring 2024 The Pro-Étale Topology (IS), Mirror Symmetry and Conformal Field Theory (IS), Analytic Number Theory (†)
Fall 2022 - Spring 2023 Algebraic Geometry (†), String Theory (†), Infinity Categories (†), Adic Spaces (†), Affinoid Spaces (IS)
Fall 2021 - Spring 2022 Abstract Algebra I (†), Complex Analysis, Abstract Algebra II (†), Real Analysis I (†)
Fall 2020 - Spring 2021* Multivariable Calculus, Discrete Math, Honors Real Analysis I, Linear Algebra
(†) = Graduate Course. IS = Independent Study. * = Concurrent Enrollment.

RESEARCH PROJECTS

PRUV Program: Étale Reconstruction Duke University May 2024 - July 2024
• The PRUV program is a selective, six-week research mentorship in mathematics. I was advised by Professor Joseph Rabinoff.
• I proved part of a conjecture of Grothendieck concerning the reconstruction of schemes from their étale sites. By adapting methods of Voevodsky, I showed that morphisms out of perfections of finite type $\mathbb{F}_p(t)$-schemes can be reconstructed from morphisms out of their étale sites. The paper is almost ready to be put on the arXiv. I should note that this was independently proven by Carlson, Haine, and Wolf.
PRUV Program: Perfectoid Spaces Duke University May 2023 - July 2023
• I wrote an expository paper on the sheafiness of perfectoid spaces and the reinterpretation of affinoid spaces and Berkovich spaces in the language of adic spaces.
Two Proofs of the Gerritzen-Grauert Theorem Duke University Spring 2023
• I wrote a more readable version of BGR's proof of the Gerritzen-Grauert theorem. I also compared their proof to Temkin's more recent proof.

MISC

Grader Duke Math Department Spring 2023 - PRESENT
• Grader for MATH 602: Commutative Algebra (Spring 23), MATH 627: Algebraic Geometry (Fall 23 and 24), and MATH 501: Abstract Algebra I (Fall 23).
Duke Undergraduate Math Seminar Duke Math Department Fall 2023 - PRESENT
• I started the Duke Undergraduate Math Seminar. I currently run the seminar.