

ZACHARY COUVILLION: CURRICULUM VITAE

EDUCATION

- Ph.D in Mathematics, Cornell University Fall 2022 - Spring 2027
Advisor: David Zywina
- B.A. in Mathematics (with high honors), Dartmouth College Fall 2018 - Spring 2022
Thesis: *On specializations of Belyi maps and inverse Galois theory*
Advisor: John Voight

HONORS/AWARDS

- Eleanor Norton York Award 2025
Awarded by the Cornell University mathematics department to two graduate students on the basis of academic achievement.
- Jack Byrne Prize in Mathematics 2021
Awarded by Dartmouth College, provides \$35000 towards the first year of graduate study to one graduating math undergraduate applying to graduate school
- Jack Byrne Scholarship for Mathematics 2018
Awarded by Dartmouth College, provides \$30000 towards resources for undergraduate research in mathematics

PUBLICATIONS/PREPRINTS

1. *Computing nonsurjective primes for Galois representations associated to abelian varieties of dimension 3 over $\mathbb{Q}$.* In preparation.
2. *Counting elliptic curves with prescribed entanglements* with Anwesh Ray. *Research in Number Theory* 11.4 (2025): 106.

TALKS

- Dartmouth Number Theory Seminar. Dartmouth College, October 13, 2026. “Computing the nonsurjective primes for Galois representations of dimension 3 abelian varieties.”
- Cornell Number Theory Seminar. Cornell University, October 23, 2025. “Computing the nonsurjective primes for Galois representations associated to dimension 3 Jacobian varieties.”
- Olivetti Graduate Student Seminar. Cornell University, October 7, 2025. “Residual Galois representations from abelian varieties.”
- Cornell Undergraduate Math Club. Cornell University, September 8, 2025. “Introduction to elliptic curves.”
- Olivetti Graduate Student Seminar. Cornell University, March 25, 2024. “Inverse Galois theory and Belyi’s theorem.”
- Mathfest (virtual presentation). August 7, 2021. “Recursions, q-series, and intertwining operators
2021 MAA Outstanding Student Paper Award
- Ursinus Summer Fellows Symposium. Ursinus College, July 23, 2021. “Recursions, q-series, and intertwining operators.”

CONFERENCES ATTENDED

- Arizona Winter School for Arithmetic Geometry. University of Arizona, March 7-11, 2026.
- Maine-Quebec Number Theory Conference. University of Maine, October 4-5, 2025.
- Midwest Arithmetic Geometry and Number Theory. Ohio State University, March 29-30, 2025.
- The Legacy of John Tate, and Beyond. Harvard University, March 17-21, 2025.

TEACHING AND TEACHING ASSISTANCE

0.1 INSTRUCTORSHIP

- Math 1110: Calculus 1, Cornell University, Fall 2025 and Spring 2026

0.2 TEACHING ASSISTANCE

- Math 6310: Graduate Algebra 1, Cornell University, Fall 2026
- Math 2940: Linear Algebra for Engineers, Cornell University, Summer 2025
- Math 3360: Applicable Algebra, Cornell University, Spring 2024 and Spring 2025
- Math 1920: Multivariable Calculus, Cornell University, Fall 2024
- Math 2210: Linear Algebra, Cornell University, Fall 2023

SERVICE

- Cornell Directed Reading Program co-organizer, Spring 2025-Spring 2027
- Cornell Directed Reading Program undergraduate mentorship
 - Spring 2026, Student: Eric Dai, Topic: Elliptic curves and algebraic geometry
 - Fall 2025, Student: Adam Hoskin, Topic: Algebraic topology
 - Spring 2025, Student: John Veliz (now a Ph.D. student in mathematics at UT Austin starting Fall 2026), Topic: The étale fundamental group
 - Spring 2024, Student: Lucas Sanderlis, Topic: Galois theory
- Cornell Math Little Circle
 - May 5, 2026: Introduced K-2 students to basic graph theory using Euler's bridge puzzle and nets of 3D shapes using paper.
 - April 21, 2026: Introduced K-2 students to the four-color theorem with coloring sheets.

TECHNICAL SKILLS

- Magma Computational Algebra System
- LaTeX