Leonardo Finzi

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Education

University of Pittsburgh, Pittsburgh, PA *Graduating April 2027*
Dietrich School of Arts and Sciences, David C. Frederick Honors College
BS in Mathematics (Departmental Honors), BA in Philosophy

- **GPA:** 3.941; **Math GPA:** 3.864, **Philosophy GPA:** 4.0
- **Accolades:** 2026 Montgomery M. Culver Prize; Swiss Benevolent Society Merit Scholarship 2026–2027, 2025–2026, 2024–2025; Dean's List Spring 2026, Fall 2025, Spring 2025, Fall 2024, Spring 2024, Fall 2023
- **Fellowships:** 2026 Brackenridge Summer Fellow; 2025 Painter Undergraduate Research Fellow
- **Major-Related Coursework:** Algebra 3 (Graduate); Analysis 1 (Graduate); Differential Geometry I (Graduate); Algebraic Geometry (Graduate); Advanced Calculus II; Algebra 1 (Graduate); Advanced Calculus I; Ordinary Differential Equations I (Honors); Abstract Algebra; Linear Algebra (Honors); Topics in Geometry; Introduction to Abstract Algebraic Systems; Introduction to Analysis (Honors); Analytic Geometry & Calculus 3

  Measurement and Aggregation (Graduate); Provability Logic (Graduate); Symbolic Logic; Ethical Theory; Rationalism; History of Ancient Greek Philosophy

Research Preprints

L. Finzi, "Testing the non-vanishing of the Ceresa cycle of $X_0(N)$", Hexagon preprint.
Link: https://hexagonmath.org/2610.00413v1

Non-Research Publications

L. Finzi and N. McCambridge, "An interview with Professor June Huh", Pittsburgh Interdiscip. Math. Rev., vol. 5, pp. 114–119, Sep. 2026. *DOI:* https://doi.org/10.5195/pimr.2026.87

L. Finzi and N. McCambridge, "An interview with Professor Camillo De Lellis", Pittsburgh Interdiscip. Math. Rev., vol. 4, pp. 132–140, Feb. 2026. *DOI:* https://doi.org/10.5195/pimr.2025.72

L. Finzi, N. McCambridge, and L. Song, "An interview with Professor James Maynard", Pittsburgh Interdiscip. Math. Rev., vol. 3, pp. 102–116, Jul. 2025. *DOI:* https://doi.org/10.5195/pimr.2025.59

Research Projects

"Elaborating Cases of Ceresa Cycles Over Modular Curves" June 2026 – August 2026
2026 Brackenridge Summer Fellowship
David C. Frederick Honors College, University of Pittsburgh

- *Advisors:* Dr. Carl Wang-Erickson, Dr. Mohamed Moakher
- *Abstract*: This project relates to classifying conditions in which certain embeddings of modular curves into higher-dimensional tori are trivial. The embeddings of importance to this project are called Ceresa cycles, since their triviality vary wildly across mathematical contexts and are a common tool used in various sub-fields. In a 2025 paper, Lupoian and Rawson were able to classify triviality conditions on these Ceresa cycles of modular curves over many cases, though some cases were omitted. The goal of this project is to understand the 2025 paper and fill in some of the omitted cases using their methods, which will be completed through a combination of independent studying, conversations with my mentor, and computations using `Magma`, a popular mathematical software system.
- Paper forthcoming on arXiv.

"The Galois correspondence of covering spaces and the analogy to Galois theory" May – August 2025
2025 Painter Undergraduate Research Fellowship
Department of Mathematics, University of Pittsburgh

- *Advisors:* Dr. Carl Wang-Erickson, Dr. Mohamed Moakher
- Conducted research on topics in algebraic topology and algebraic number theory as a Painter Undergraduate Research Fellow.
- Wrote an expository manuscript discussing the theory of covering spaces in algebraic topology by categorically classifying all covering spaces of certain spaces and drawing an analogy to Galois theory.
- Presented the contents of this paper at the 2026 Undergraduate Colloquium at the University of Pittsburgh's Department of Mathematics.

Professional Associations

Co-Editor-in-Chief, Associate Editor — February 2024 – *Present*
Pittsburgh Interdisciplinary Mathematics Review (PIMR) – Pittsburgh, PA

- Carry out the responsibilities of an Editor-in-Chief.
  - Manage a team of editors and referees.
  - Solicit undergraduate research and expository articles from professors and PhD candidates through outreach to other universities.
  - Make decisions regarding the publishability of articles.
- Carry out the publishing process for Volumes II–V.
- Copy-edited articles and communicated with authors as an Associate Editor for Volumes I–II.

Presenter — July 6, 2026
David C. Frederick Honors College Summer Research Conference – Greensburg, PA

- *Title*: Elaborating Cases of Ceresa Cycles over Modular Curves
- *Abstract*: In 1983, Ceresa proved that, given a curve C, a certain algebraic cycle defined on the Jacobian $\mathrm{Jac}(C)$ of C is non-trivial under algebraic equivalence, while being homologically trivial on $\mathrm{Jac}(C)$. Since then, work has been done to understand the triviality of this cycle, now called a Ceresa cycle, on $\mathrm{CH}_1(\mathrm{Jac}(C))$, that is, under what conditions the Ceresa cycle is trivial under rational equivalence, a weaker condition to algebraic equivalence. In particular, in a 2025 paper, conditions in which the Ceresa cycle of the modular curve $X_0(N)$ is non-trivial were found, developing methods that can be applied to more cases than they considered.

Presenter — April 24, 2026
Joint CMU-Pitt Directed Reading Program Colloquium – Pittsburgh, PA

- *Title*: Group Schemes
- *Abstract*: This presentation explores affine and projective group schemes as studied throughout the DRP. First, the anti-equivalence between the category of affine S-groups and the category of commutative quasi-coherent Hopf $\mathcal{O}_S$-algebras is discussed. Next, abelian k-varieties are discussed, featuring an extreme theorem regarding the cohomology of non-trivial line bundles over abelian k-varieties.

Undergraduate Presenter — February 20, 2026
2026 Undergraduate Colloquium – Department of Mathematics, University of Pittsburgh, Pittsburgh, PA

- *Title*: The Galois Correspondence of Covering Spaces
- *Abstract*: In field theory, Galois theory allows us to translate the problem of finding intermediate field extensions into the problem of finding subgroups of a group. Analogously, given certain "nice" conditions on a topological space X, we can translate between problems involving covering spaces of X and problems involving groups. In particular, we correspond to any covering spaces of X, a subgroup of the fundamental group $\pi_1(X, x)$, for some fixed $x \in X$. As in the "usual" Galois theory, the power of this result lies in the fact that it allows us to algebraically determine the pointed covering spaces of X, which is generally difficult to do by topological inspection. This presentation presents a proof for this correspondence by showing that the category of orbits of $\pi_1(X, x)$ is equivalent to the category of the covers of X.

Expositorial Writing

"Group Schemes: Affine and Projective" January – April 2026
Joint CMU–Pitt Directed Reading Program

- *Advisor:* Eugene Eyeson
- A research project on group schemes following Mumford and Oda's *Algebraic Geometry II* and other sources, with topics including Cartier duality, the dual of an abelian variety, and cohomology of abelian varieties. Special focus was paid to abelian varieties over arbitrary fields.
- Conducted research independently and attended weekly meetings with graduate mentor.

"**Adjoint Functors, the Tensor Product, and Symmetric Algebras**" November – December 2025
MATH 2500: Algebra 1 (University of Pittsburgh)

- An expository article and presentation discussing the construction of the symmetric algebra functor and its role in the categories of R-modules and commutative R-algebras.
- Conducted research on topics in category theory and categorical abstract algebra, including adjointness, tensor products, and symmetric algebras.

"**A Categorical Framework for the Double-Negation Translation and Modal Translation**" November – December 2025
PHIL 1500: Symbolic Logic (University of Pittsburgh)

- An article outlining a categorical framework to understand the double-negation translation and modal translation between intuitionistic and classical propositional logic.
- Conducted research on topics in category theory and lattice theory.

"**The Rectification Theorem**" April 2025
MATH 1275: Honors Ordinary Differential Equations 1 (University of Pittsburgh)

- A project elaborating on the mathematical context and proof of the rectification theorem given in Arnol'd's *Ordinary Differential Equations*.
- Conducted research and analyzed mathematical textbooks on ordinary differential equations.

"**The Projective Plane: A Historical and Affine Digestion**" December 2024
MATH 1290: Topics in Geometry (University of Pittsburgh)

- A project on understanding the real projective plane through a study of isomorphisms with the real Euclidean plane.
- Conducted research and analyzed mathematical textbooks and papers.

Employment Experience

Peer Tutor January 2025 – *Present*
Math Assistance Center, University of Pittsburgh – Pittsburgh, PA

- Tutor undergraduate students in the calculus sequence, abstract algebra, linear algebra, analysis, and general proof-writing.
- Lead final exam review sessions for MATH 0280: Introduction to Matrices & Linear Algebra.

Tour Guide September 2023 – *Present*
Office of Admissions and Financial Aid, University of Pittsburgh – Pittsburgh, PA

- Give an hour-long tour each week to prospective and admitted students.
- Work official admission programs through tabling, giving tours, and leading panels.
- Trained to give tours of Pitt's lower campus, upper campus, and the city of Pittsburgh.

Undergraduate Teaching Assistant August – December 2025
Department of Mathematics, University of Pittsburgh – Pittsburgh, PA

- Designed lectures and review sessions for semiweekly recitations for MATH 0120: Business Calculus.
- Led 3 hours of office hours each week.

Tutor November 2023 – April 2024
PittEnrich – Pittsburgh, PA

- Trained to develop and utilize play-based lesson plans to develop critical mathematical skills for students in grades 1-5 in Homewood, Pittsburgh.
- Trained to identify skill deficiencies in students and personalize lesson plans accordingly, both in advance and during a lesson.

Extra-Curricular Activities

Member August 2023 – *Present*
Math Club, University of Pittsburgh – Pittsburgh, PA

- Attended weekly meetings.
- Assisted in the operation of the annual integration bee.

Volunteer October – December 2023
Keep It Real – Pittsburgh, PA; (*21 total hours*)

- Tutored Somali-Bantu children from grade levels K-7 in all subjects at the Northview Heights location.

Volunteer Tutor February 2021 – June 2023
Tutors4Yemen – Online; (*70 total hours*)

- Tutored NYC children from grade levels 3-6 in math, science, and social studies over Zoom to raise money for humanitarian organizations dedicated to helping Yemeni people during their civil war.

Student June – July 2022
University of Michigan MMSS High School Summer Program – Ann Arbor, MI

- Took the "Polynomial Party Platter" course, which focused on exploring polynomials across mathematical disciplines.

Relevant Skills

Organization, communication, mathematical analysis, problem solving, team management, independent research, critical thinking, public speaking, collaboration.

Proficiencies in LaTeX, Magma Computational Algebra System, Sage Math, Wolfram Mathematica, Python, Java, Microsoft Office (including Excel), Adobe Suite, Google Suite.