Vihaan Dheer

University of California, Berkeley

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Education

UC Berkeley, Berkeley, CA 2023-present

GPAs: Overall GPA: 4.000, Mathematics GPA: 4.000

Relevant Coursework — Graduate level (Grade: A/A+)**:** Algebra, Topology & Analysis, Manifold Theory, Commutative Algebra, Algebraic Topology, Descriptive Set Theory, Algebraic Geometry, Lie Groups, Independent Study in Homotopy Theory

Coursework In Progress — Graduate level: Algebraic Topology II, Algebraic Geometry II, Infinite-dimensional Lie Algebras, Representation Theory of Groups

Hackley School, Tarrytown, NY 2019-2023

Grades: GPA: 4.29/4.00 (weighted). *Graduated with Cum Laude honors.* SAT Score: 1560

AP Scores: ▪ AP Physics C: Mechanics - 5 ▪ AP Physics C: E&M - 5 ▪ AP Calculus BC - 5 ▪ AP Computer Science A - 5 ▪ AP Chemistry - 5 ▪ AP Spanish - 5 ▪ AP Statistics - 5

Research/Supervised Independent Study

Homotopy Theory & Higher Category Theory 2024-2025

- Supervised reading course at UC Berkeley in modern homotopy theory. Topics include: simplicial methods, infinity categories, Dold-Kan correspondence, homotopy hypothesis. Primary text: Goerss & Jardine, *Simplicial Homotopy Theory*. Instructor: Peter Haine; Supervisor: David Eisenbud.
- Expository paper on the most general form of Dold-Kan correspondence — includes original work for semiadditive categories: naahiv.github.io/extending-dold-kan.pdf.

Monoidal Category Theory - Research 2021-2023

- Studied unbiased monoidal categories with infinitary tensor products. Paper entitled “An Infinitary Model of Diagrammatic Calculus in Unbiased Monoidal Categories”; DOI: 10.48550/arXiv.2304.03725.

Infinity Categories & Homotopical Algebra 2022-2023

- Supervised independent study at Hackley School focused on category theory and simplicial sets as prelude to homotopy theory. Topics included: simplicial methods, model categories, Kan complexes. Primary text: Cisinski, *Higher Categories & Homotopical Algebra*. Instructor: Keshena Richardson.

Quantum Computing - Qubit Control. Published *AIP Advances* - Research 2020-2021

- Studied a method of improving CZ gates for transmon qubits. Project entitled “The Optimization of Flux Trajectories for the Adiabatic Controlled-Z Gate on Split-Tunable

Transmons"; published as sole-authored research in the peer-reviewed journal of the American Institute of Physics, *Advances*, DOI: 10.1063/5.0087364.

Awards/Honors

- **Senior Mathematics Award** June 2023

  Awarded by Hackley School to the senior who best demonstrates mastery in math.
- **2023 Regeneron Science Talent Search (STS) Scholar** January 2023

  Selected as one of the Top 300 Scholars in the 2023 Regeneron Science Talent Search (formerly sponsored by Intel and Westinghouse), chosen for my research project in quantum computing.
- **Junior Mathematics Award** June 2022

  Awarded by Hackley School to the junior who best demonstrates mastery in math.
- **Sole-authored Research Publication** September 2022

  Research in quantum computing published in peer-reviewed journal American Institute of Physics *Advances*; DOI: 10.1063/5.0087364
- **2022 WESEF Mu Alpha Theta Award in Mathematics** March 2022

  As a part of Westchester Science & Engineering fair; won Mu Alpha Theta award for use of mathematics in research project in quantum computing
- **2022 Westchester Science & Engineering Fair** March 2022

  Earned 2nd place award for research project in quantum computing

Work Experience

E. I. Investments 2020–2024

Software Developer

- Worked with trader/investor on software product for market data analysis and automated trading

ImpactPlease.org 2020–present

Web App Developer & Designer

- Developing web application for ImpactPlease.org, a startup which connects potential donors in the US with small non-profits in India and other developing countries