

CURRICULUM VITAE

ARAV V. KARIGHATTAM

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Education

A.B. Mathematics, Harvard University, *magna cum laude* with Highest Honors (grad. 3/2024) 2019–2023
High School Diploma, Door 55 School (homeschool) 2009–2019

**Note: While in high school and under (age 8–15), I completed 28 undergraduate and graduate mathematics courses and 15 physics courses at UC Davis and 4 graduate mathematics and 2 graduate physics courses at Harvard. I have official transcripts for most of the UC Davis courses. Having this background enabled me to take primarily special topics and reading/research courses while an undergraduate student at Harvard.*

Research Interests

Algebraic Number Theory, Arithmetic Geometry and related fields such as Algebraic Geometry, Arithmetic Statistics, and Modular Forms.

Preprints

1. *Heegner point constructions and fundamental units in cubic fields*, arxiv: 2407.12834 (2024), submitted

Senior Thesis

Explicit Modular Parametrizations and Heegner Point Constructions, Harvard University (2023)

Expository Papers

1. *The Average Size of Selmer Groups of Elliptic Curves*, for Math 280Y: Arithmetic Statistics (2023)
2. *The Geometric Sieve and Asymptotics for Counting Number Fields*, for Math 273X: Distributions of Class Groups of Number Fields (2020)
3. *Applications of the theta function to sums of squares*, for Math 213A: Complex Analysis (2019)
4. *Bounding the rank of rational elliptic curves*, for Math 223A: Algebraic Number Theory (2018)
5. *Hawking Radiation and its Implications*, for Physics 260 (UC Davis): General Relativity (2016)

Talks

1. *Heegner points on $y^2 = x^3 + p$* , Mordell's Conjecture 100 Years Later, Massachusetts Institute of Technology (2024)
2. *The Galois group of the 27 lines on a rational cubic surface*, MIT-Primes Conference, Massachusetts Institute of Technology (2019)

Conferences Attended

Analytic Number Theory and Arithmetic Statistics, Université de Montréal, Montréal, QC (2024)
Mordell's Conjecture 100 Years Later, Massachusetts Institute of Technology, Cambridge, MA (2024)
MIT-Primes Conference, Massachusetts Institute of Technology, Cambridge, MA (2019)
Joint Mathematics Meetings, San Diego, CA (2017)
West Coast Number Theory, Pacific Grove, CA (2016)

Honors

Hertz Fellowship, Finalist (second round interview in 02/2025)	2025
Paul and Daisy Soros Fellowship for New Americans, Finalist (interview in 02/2025)	2025
Thomas T. Hoopes Prize (awarded for outstanding undergraduate research and senior thesis)	2024
John Harvard Scholar (awarded for perfect grades)	2020–2021, 2022–2023

Awards

Putnam – Score: 68 (Top 25 Individuals); on Harvard team (2nd place)	2023
– Score: 64 (Honorable Mention); on Harvard team (2nd place)	2022
USAMO qualifier	2019
USAJMO winner; invited to Math Olympiad Program	2018
Stanford Math Tournament – Discrete Math (Top 5), Calculus (Top 10)	2018
ARML – On 2nd place team	2018
– On 1st place team	2016–2017
ARML Local – Team Winner	2018
– Individual Winner	2016
Who Wants to be a Mathematician – Team Winner	2017

Languages

Python, L^AT_EX, HTML/CSS.

Media/Articles

[Article featuring my solution to 2023 Putnam Problem B3](#) (The American Mathematical Monthly)
[Prof. Barry Mazur invited me to be part of a documentary honoring him](#)
[Meet the Youth Winner of the Audubon Photography Awards: Arav Karighattam](#) (WBUR)
[A documentary created by UC Davis students about me when I was 10 years old](#) (Aggie Studios)
[“10-year-old prodigy attends UC Davis”](#) (California Aggie)
[“Gifted siblings capture the world around them”](#) (Davis Enterprise)
[Website my mother had created documenting my progress over the years](#)

Other

Youth Winner, Audubon Photography Awards (2021)
Winner, Music Teachers' Association of California, Composers Today (2014)
National and International Winner, Golden Key Piano Competition for Composers (2014)
Voices of Lincoln Poetry Contest, 18 and under category 4-time winner (2010-2013)