

Henry Gustafson

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Education

California Institute of Technology

Fall 2024 – present

B.S. in Computer Science and Mathematics

Current GPA: 4.3

Coursework: Ma 5abc (Abstract Alegbra), Ma 121a (Combinatorial Analysis), Placement Test Credit (Ma 1, CS 1)

High School

The College Preparatory School: High School Diploma

2020 – 2024

Math Club President, Computer Science Team President and Founder, Linguistics Club President, Math+Writing+Spanish Peer Tutor

Research Experience

Lingistics Research: Caltech SURF

2025 –

Researching algebraic models of syntax with Hopf algebras and hypermagmas. Studying renormalization and phase structure of grammar. Mentor: Matilde Marcolli.

Research Internship: Wolfram Institute

2023 – 2024

Researcher in Wolfram Metamathematics Project. Created proof assistant paclet for group theory based on SK combinator calculus. Analyzed multiway evolution of combinator expressions for ternary groups.

Wolfram Emerging Leaders Program: Researcher

2022, 2023

Sub-axiomatic foundations of group theory in SK combinators: <https://community.wolfram.com/groups/-/m/t/2818259>. Quantifying language efficiency through comparative analysis of translated texts: <https://community.wolfram.com/groups/-/m/t/2456491>.

Wolfram Summer Research Program: Student Researcher

2021, 2022

Analyzed multiway games: <https://community.wolfram.com/groups/-/m/t/2317406>. Optimized traffic lights in cellular automata city traffic models: <https://community.wolfram.com/groups/-/m/t/2579941>.

Camp Euclid: Math Research

2020

Researched Collatz conjecture, simulated variations.

Teaching Experience

Caltech Rise: Tutor

2024 –

Volunteer math and science tutor for high school students in Pasadena.

Wolfram Summer Research Program: Teaching Assistant, Mentor

2023, 2024

Mentored high school students in research projects. Taught functional programming.

The Partners Program: Tutor, Teaching Assistant

2022, 2023, 2024

Tutored under-resourced students in Oakland. Taught classes on programming and debate.

Last updated February 18, 2025