

Sofia P. Robertson

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EDUCATION

Harvey Mudd College, Claremont, CA

Expected Graduation: May 2027

B.S., Computer Science and Physics

Dean's List (Spring 2024, Fall 2024, Spring 2025)

Relevant Coursework: Quantum Mechanics, Math & Computational Methods for Physicists, Principles of Computer Science, Electromagnetic Theory & Optics, Mechanics & Wave Motion, Special Relativity, Differential Equations, Multivariable Calculus

SKILLS

Programming: Python, Java, JavaScript, C++, HTML, HTMX, CSS, SQL, Django, Racket, NumPy, SciPy, Matplotlib, Jupyter

Other: Human-Centered Design, Youth Mentoring, Problem Solving, Communication, Microsoft Office, Google Suites, Data Collection, Analysis, Strategic Planning, Advanced Spanish (read/write)

RESEARCH

Planetary Origins and Evolution Lab, Harvey Mudd College, *Researcher*

January 2025- Present

- Worked on developing SPOCK (Stability of Planetary Orbital Configurations Klassifier), a ML model used to predict orbital stability of planetary systems. Conducted N-body resonance analyses to evaluate orbital dynamics and long-term stability.
- Designed and implemented the Hill Stability Factor feature, quantifying proximity to the critical planetary separation for stability for a 2-body system without requiring full simulations.
- Improved model prediction accuracy by enhancing a existing model feature, Strongest Mean Motion Resonance, to calculate the ratio of planets' resonance width and the maximum resonance width to determine the strongest resonance.

National Radio Astronomy Observatory, Green Bank Observatory, *REU Student*

May 2024 - August 2024

- Developed an integrated, real-time, web-based dashboard for the Green Bank Telescope as a proof of concept using Django, HTML, HTMX, CSS, JavaScript, which unifies access to various GBT data sources and software systems.
- Used analog radio equipment to map the Sagittarius A* region to produce a radio map of active regions in the Milky Way.

JWST & Origin of the Universe, Space Telescope Science Institute, *Researcher*

September 2022 - May 2023

- Research/hypothesize different origin theories of the universe. Compare data from the James Webb Space Telescope and Hubble, under the guidance of Rachel Cooper, Science Support Analyst at Space Telescope Science Institute.

PROJECTS

p-DataSciWebsite 2024 project, Harvey Mudd College, *Software Engineer*

August 2024 - December 2024

- Collaborated with the software engineering team to build a centralized, user-friendly resource hub for Scripps College's Data Science Department, leveraging human-centered design principles to serve the 5Cs and broader STEM community.
- Enhanced usability while developing the site using React.js (frontend) and Flask (backend).

Terminal-Based Tic-Tac-Toe Game, Harvey Mudd College

October 2023 - December 2023

- Utilize a global 3x3 grid, track game dynamics with variables, and employ modular functions for display in Python.

JOBS & VOULENTEERING

Physics 24 (Mechanics & Wave Motion), Harvey Mudd College, *Grader*

January 2025 - May 2025

- Grade and provide feedback on homework to 200+ students taking Mechanics & Wave Motion course.

Physicists Inspiring the Next Generation, Green Bank Observatory, *Mentor*

June 2024 - August 2024

- Supervised and mentored 20 students during educational seminars and lectures about astrophysics. Oversaw and supported a group of 5 students to conduct research with a 40-foot diameter radio telescope.

Rosa A. Garcia Lung Cancer Association, *Co-Founder/Volunteer*

March 2019 - March 2024

- Manage Lung Cancer non-profit. Organize programs: annual fundraising walks; created website & manage content.

PUBLICATIONS

- S. Robertson, T. Chamberlin., A Real-Time Web-Based Dashboard for Comprehensive Green Bank Telescope System Monitoring, *National Radio Astronomy Observatory*. <https://www.nrao.edu/students/2024/Reports/RobertsonSofia.pdf> (2024).

PROFESSIONAL AFFILIATIONS

Minoritized Genders across Physics at Harvey Mudd College

2023 - Present

Latina Empowerment and Development at Harvey Mudd College

2023 - Present