Mariam Helal

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Education

University of California, Berkeley — *Berkeley, CA, USA*
BA in Planetary Science & Astrophysics, Minor in Chemistry — *May 2028*

- *GPA*: 4.0/4.0
- *Relevant Coursework:* Introduction to Astrophysics I & II, The Planet Earth, General Chemistry I with Lab, Differential Equations, Linear Algebra, Multivariable Calculus, Electricity & Magnetism, Optics, Thermodynamics, Classical Mechanics, Planetary Astrophysics

Mission Early College High School — *Santa Clara, CA, USA*
High School Diploma, AS-T in Physics — *May 2024*

- *GPA*: 4.8/4.0
- *SAT*: 1570

Research

Ramsden Research Fellow — *Berkeley, CA, USA*
Macdonald Lab — *Oct 2024 – present*

- Executed mineral separation methods, including panning and magnetic separation, in order to extract zircons from samples for subsequent U-Pb geochemistry analyses
- Trained in and independently operated jaw crusher, sledge box, drill press, tile saw, & disk mill
- Investigated relationship between carbon isotope values and lithologies of carbonate rocks from the Otavi group in Namibia
- Awarded Ramsden Fellowship to work on developing protocol to analyze major element compositions of carbonates using XRF, and applying this technique to assess the effects of diagenesis and minerology on the Trezona anomaly

Undergraduate Researcher — *Berkeley, CA, USA*
Bergner Lab — *Feb 2025 – present*

- Utilized CASSIS program to identify PO/PN molecules in the spectra of protostars obtained from the ALMA telescope
- Conducted rigorous analysis of spectra to identify contaminant molecules
- Used CASSIS LTE-RADEX feature to routinely eliminate contaminant peaks by fitting synthetic spectra using literature-obtained column densities and rotational temperatures

Student Researcher — *Fremont, CA, USA*
Aspiring Scholars Directed Research Program — *Sept 2022 – Dec 2023*

- Contributed to two marine biology research projects, focusing on the impact of anthropogenic pollutants on marine life
- Carried out tissue digestion of Mytilus californianus specimens, utilizing chemical treatments to break down the mussel tissue while preserving and isolating microplastic contaminants
- Operated Inverted Fluorescence Microscope to observe and quantify microplastic particles
- Compiled results into preprint: *Testing a Method for Quantifying Microplastic Content in Mytilus californianus*

Leadership

Extrusion Team Member — *Berkeley, CA, USA*
Student Environmental Resource Center — *Sept 2024 – present*

- Member of 3D Printer Filament Reclamation Extrusion sub-team, researching and testing methods for extrusion of recycled 3D printer filament to create a closed-loop campus filament recycling program

- Operated the Filabot extrusion and spooling systems to create recycled filament spools from 3D printing waste, optimizing different parameters in order to produce consistent, high-quality spools

Sensor Placement Co-Lead *Berkeley, CA, USA*
Strawberry Creek Monitoring Group *Jan 2025 – present*

- Created social media posts to provide outreach on SCMG activities and creek health
- Co-led sensor placement efforts, finding optimal locations to place sensors monitoring creek activity

Telescope Crew *Berkeley, CA, USA*
Undergraduate Astronomy Society *Sept 2024 – present*

- Operated Newtonian & Schmidt-Cassegrain telescopes, as well as Treffers, the UC Berkeley Campbell rooftop telescope
- Co-facilitated weekly Sidewalk Astronomy outreach events to engage the campus community in public observation sessions

Professional Experience

Chief Scientist *Remote*
NASA L'SPACE Mission Concept Academy *Jan 2025 – May 2025*

- Participated in weekly seminars covering the process of NASA mission concept development and learning from industry professionals
- Led team of 5 through science-delegated tasks, developing a NASA mission concept for a Aerobot system to conduct research on the Venusian atmosphere and surface
- Navigated surprise roadblocks by revaluating priorities and descoping
- Presented on final PDR document to board of mentors, providng a summary of our mission and answering clarifying questions
- Earned skill badges in Teaming, Requirements, and Project Management

Teaching

Python DeCal Student Facilitator *Berkeley, CA, USA*
UC Berkeley Department of Astronomy *Jan 2025 – present*

- Graded homework assignments and mentored students on final projects
- Co-hosted office hours to provide students with individual and address coding questions
- Co-taught lectures on Python programming, plotting, and data analysis techniques

Awards

Ramsden Research Fellowship *Summer 2025*

Dean's List *Fall 2024*

Presidential Volunteer Service Certificate *Fall 2023*

Principal's Honor Roll *2022, 2023, 2024*

Skills

Lab: Microscopy, XRF, Mineral Separation

Coding: Python, Matplotlib, Pandas, NumPy, Seaborn, Cartopy, LaTeX, HTML, CSS

Programs: CASSIS, CARTA

Languages: English, Arabic