Mariam Helal

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Education

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

- *GPA*: 4.0/4.0
- *Relevant Coursework:* Introductory Astrophysics, General Chemistry, Organic Chemistry, Planetary Astrophysics, Calculus, Differential Equations, Linear Algebra, General Physics

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*

- Developing protocol for usage of hand-held XRF instrument to analyze and interpret major element compositions of carbonates and iron formations
- Investigating effects of diagenesis and minerology on δ13C values of carbonates recording the Trezona anomaly

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

- Modeling proto-planetary disks using radmc3d to correct for rotational motion effects on column-density calculations of molecules
- Conducted molecule identification and spectral analysis of ALMA proto-stars to probe phosphorus chemistry in planet-forming regions

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

- Developed protocol for quantifying microplastic content in California mussels (Mytilus californianus) using enzymatic digestion and fluorescence microscopy
- Compiled results into preprint: *Testing a Method for Quantifying Microplastic Content in Mytilus californianus*

Teaching

ASTRON/EPS C162 - Planetary Astrophysics Reader — *Berkeley, CA, USA*
UC Berkeley Department of Astronomy & Department of Earth & Planetary Sciences — *Aug 2025 – present*

- Graded student work, including problem sets and exams

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

- Taught lectures on Python programming, plotting, and data analysis techniques
- Co-hosted office hours to provide students with individual support and address coding questions
- Carried out instructional duties including grading homework assignments and mentoring students on final projects

ASTRON/EPS W12 - Planets Tutor/Reader — *Remote*
UC Berkeley Department of Astronomy & Department of Earth & Planetary Sciences — *June 2025 – Aug 2025*

- Interacted with students via discussions and office hours
- Point of contact for sections of the class, assisting student with material-related and administrative questions

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 and navigating surprise roadblocks through reevaluating priorities and descoping
- Presented final PDR document to board of mentors, providing a summary of our mission and answering clarifying questions

Extracurriculars

Telescope Crew Officer *Berkeley, CA, USA*
Undergraduate Astronomy Society *May 2025 – 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

MPS Scholars Mentor *Berkeley, CA, USA*
Math & Physical Sciences Department, UC Berkeley *May 2025 – present*

- Advised incoming freshman on course selection, research opportunities, and academic planning within the EPS and Planetary Science disciplines
- Hosted regular mentoring meetings to address student questions and provide academic and personal support

Extrusion Sub-team Member *Berkeley, CA, USA*
Student Environmental Resource Center *Sept 2024 – May 2025*

- Researched and tested methods for extrusion of recycled 3D printer filament to create a closed-loop campus filament recycling program

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

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

Awards & Honors

Ramsden Research Fellowship *Summer 2025*

Dean's List *Fall 2024*

Presidential Volunteer Service Certificate *Fall 2023*

Skills

Lab: Microscopy, XRF, Mineral Separation

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

Programs: CASSIS, CARTA, radmc3d

Languages: English, Arabic