

Mariam Helal

📍 Berkeley, CA ✉ mariam.helal@berkeley.edu 📞 (626) 620-1627 🌐 marihelal 📷 marihelal

Education

University of California, Berkeley

Berkeley, CA, USA

BA in Planetary Science, BA in Astrophysics, Minor in Chemistry

May 2028

- GPA: 3.955/4.0
- *Relevant Coursework:* Introductory Astrophysics, General Chemistry, Organic Chemistry, Physical Chemistry, Planetary Astrophysics, Calculus, Differential Equations, Linear Algebra, General Physics, Physics of Planetary Interiors, Electricity & Magnetism

Mission Early College High School

Santa Clara, CA, USA

High School Diploma, AS-T in Physics

May 2024

Research

Undergraduate Researcher

UC Berkeley, CA, USA

Bergner Lab

Feb 2025 – present

- Modeling edge-on protoplanetary disks using radmc3d to analyze relationship between inclination and column density calculations
- Modeling water ice emission in protoplanetary disks
- Conducted molecule identification and spectral analysis of ALMA proto-stars to probe phosphorus chemistry in planet-forming regions

CIERA REU Intern

Northwestern, IL, USA

Center for Interdisciplinary Exploration and Research in Astrophysics (CIERA) REU

June 2026 – present

- Developed model of salt diapirism on Europa in order to quantify its contribution to material transfer in Europa's icy shell
- Determined the existence of an upper limit on salt diapir size and derived material and salt flux

Ramsden Research Fellow

Berkeley, CA, USA

Macdonald Lab

Oct 2024 – May 2026

- Developed protocol for usage of hand-held XRF instrument to analyze and interpret major element compositions of carbonates
- Investigated effects of diagenesis and mineralogy on $\delta^{13}\text{C}$ values of carbonates recording the Trezona anomaly

Teaching

Python DeCal Student Facilitator

UC Berkeley, CA, USA

UC Berkeley Department of Astronomy

Jan 2025 – present

- Taught lectures on Python programming, plotting, and data analysis techniques
- Hosted office hours to provide students with individual support and address coding questions

ASTRON/EPS C12 - Planets Reader

UC Berkeley, CA, USA

UC Berkeley Department of Astronomy & Department of Earth & Planetary Sciences

Jan 2026 – May 2026

ASTRON/EPS C162 - Planetary Astrophysics Reader

UC Berkeley, CA, USA

UC Berkeley Department of Astronomy & Department of Earth & Planetary Sciences

Aug 2025 – Dec 2025

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

NASA L'SPACE Mission Concept Academy

Remote

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 descopeing
- Presented final PDR document to board of mentors, providing a summary of our mission and answering clarifying questions

Extracurriculars

ULAB Mentor

Undergraduate Laboratory at Berkeley (ULAB), Physics & Astronomy

Berkeley, CA, USA

Sept 2025 – May 2026

- Mentored new undergraduates through research project analyzing ALMA observations of protoplanetary disks, culimanting in creation of research poster presented to faculty and students in the Physics & Astronomy Departments

Telescope Crew Officer

Undergraduate Astronomy Society

Berkeley, CA, USA

May 2025 – present

- Operated & trained telescope crew in usage of Newtonian & Schmidt-Cassegrain telescopes
- Trained in and operated the Richard Treffers 17" PlaneWave telescope, of the UC Berkeley Department of Astronomy
- Co-facilitated weekly Sidewalk Astronomy outreach events to engage the campus community in public observation sessions

MPS Scholars Mentor

Math & Physical Sciences Department, UC Berkeley

Berkeley, CA, USA

May 2025 – present

- Advised 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

Student Environmental Resource Center

Berkeley, CA, USA

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

Strawberry Creek Monitoring Group

Berkeley, CA, USA

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 - \$7500
- Fall 2025 - \$2000

Dean's List

Fall 2024, Fall 2025

Presidential Volunteer Service Certificate

Fall 2023

Presentations

Salt Diapirism in Europa's Periodically Thickening Icy Shell

Aug 2026

Adler Planetarium Astronomy Conversations, CIERA REU Poster Session, CIERA REU Final Presentations

- Oral & poster presentation

Modeling Water Ice in Protoplanetary Disks

April 2026

UC Berkeley Physics & Astrophysics Undergraduate Research Colloquium

- Oral presentation & panel

Evaluating the Handheld XRF as a Means for the Major Element Analysis of Carbonates

April 2026

2026 GSA Cordilleran Section Meeting

- Poster presentation

Skills

Lab: Microscopy, XRF, Mineral Separation

Coding: Python, Matplotlib, Pandas, NumPy, SciPy, Seaborn, Cartopy, LaTeX, HTML, CSS, HPC (Savio)

Programs: CASSIS, CARTA, radmc3d

Languages: English, Arabic

Memberships

Geological Society of America

2025, 2026

Student Member

American Physical Society

2025, 2026

Student Member

American Geophysical Union

2026

Student Member