

KAYLEE BARRERA

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EDUCATION

Massachusetts Institute of Technology, Cambridge, MA

S.B in Earth, Atmospheric, and Planetary Sciences; S.B in Physics

Expected June 2026

RESEARCH EXPERIENCE

MIT Kavli Institute, Cambridge, MA

June 2024 – Present

Undergraduate Researcher

Advisors: Dr. Sarah Blunt & Prof. Andrew Vanderburg

- Led development of *eurydice*, a Python package for cross-validation of Gaussian Process (GP) models of stellar activity in radial velocity data.
- Investigated and compared multiple GP modeling approaches using *eurydice* while modeling the HD 63433 planetary system to evaluate their effectiveness in mitigating stellar activity.
- Awarded Lamat Fellowship at University of California, Santa Cruz in Summer 2025 to continue and expand this research.

MIT Remote Observing Lab, Cambridge, MA

February 2025 – June 2025

Undergraduate Researcher

Advisor: Dr. Michael Person & Dr. Artem Burdanov

- Continued analysis of data collected at the IAC, focusing on variability in the VHS 1256-1257 brown dwarf system and rotational light curves of asteroid 2024 PT5.
- Applied time-series analysis techniques using *prose* (Python) and *Tycho Tracker* to produce light curves and identify key periods.

Instituto de Astrofísica de Canarias (IAC), Tenerife, Spain

January 2025

Visiting Undergraduate Researcher

Advisor: Dr. Artem Burdanov

- Operated professional meter-class telescopes at Teide Observatory during a three-week intensive observational astronomy research course.
- Collected and began preliminary analysis of photometric data for the triple brown dwarf system VHS 1256-1257 and asteroid 2024 PT5.

MIT Wallace Observatory, Westford, MA

May – August 2023

Undergraduate Researcher

Advisor: Dr. Michael Person

- Planned and captured 100+ hours of photometric observations with 5 different telescopes as part of a team of 6 undergraduates.
- Processed and analyzed light curves for 8 Koronis family asteroids and Pluto to measure photometric changes over their rotational periods using *AstroImageJ*.

PUBLICATIONS

3. Brothers, T. C., Abbasi, F. N., Ekelmann, J., et al. (including **Barrera, K.**) *Lightcurve and Rotation Period of Near-Earth Asteroid 887 Alinda During the 2025 Close Approach*, Minor Planet Bulletin, 52, 211 (2025)
2. Slivan, S. M., **Barrera, K.**, Colclasure, A. M., et al. *Lightcurves and Derived Results for Koronis Family Member (452) Hamiltonia*, Minor Planet Bulletin, 51, 176 (2024)
1. Slivan, S. M., **Barrera, K.**, Colclasure, A. M., et al. *Lightcurves and Derived Results for Koronis Family Member (5139) Rumoi Including a Discussion of Measurements for Epochs Analysis*, Minor Planet Bulletin, 51, 6 (2024)

RESEARCH & CONFERENCE PRESENTATIONS

Talks:

2025 Lamat Research Symposium (<i>Santa Cruz, CA</i>)	August 2025
MIT Astronomy Field Camp Symposium at the IAC (<i>La Laguna, Tenerife, Spain</i>)	January 2025
MIT Stellar Contamination Workshop (<i>Cambridge, MA</i>)	September 2024
Summer MIT Kavli Institute Undergraduate Research Forum (<i>Cambridge, MA</i>)	August 2024

Posters:

2025 Sagan Summer Workshop (<i>Virtual</i>)	July 2025
Extremely Precise Radial Velocities 6 (<i>Porto, Portugal</i>)	July 2025
Emerging Researchers in Exoplanet Science Symposium X (<i>Princeton, NJ</i>)	June 2025

AWARDS & FELLOWSHIPS

Lamat Fellowship — University of California, Santa Cruz	Summer 2025
The EAPS Undergraduate Achievement Award — MIT EAPS Dept.	May 2025

LEADERSHIP

MIT Undergraduate Women in Physics (UWiP)

<i>Co-President</i>	March 2025 – Present
<i>Co-Vice President of Social</i>	March 2024 – March 2025

Earth, Atmospheric, and Planetary Sciences (EAPS) Undergraduate Council

<i>President</i>	February 2025 – Present
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TEACHING

Undergraduate TA for 12.409 (Hands-On Astronomy: Observing Stars and Planets)	Spring 2025
Department of Earth, Atmospheric, and Planetary Sciences, MIT	

- Assisted 13 students with fundamental concepts for amateur astronomy, such as skills for sky navigation, astrophotography, and telescope use.

SKILLS

Programming Languages: Python, MATLAB, LaTeX

Workshops: Code/Astro (2024), Sagan Summer Workshop (2025), Other Worlds Laboratory (2025)

Memberships: Society of Physics Students, American Physical Society

Last updated: August 4, 2025