

# KAYLEE BARRERA

kaybar@mit.edu | Website: [kaybarr4.github.io](https://kaybarr4.github.io)

## EDUCATION

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**Massachusetts Institute of Technology**, Cambridge, MA

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

Expected June 2026

## RESEARCH EXPERIENCE

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**MIT Kavli Institute**, Cambridge, MA

June 2024 – Present

Undergraduate Researcher

*Advisors: Dr. Sarah Blunt & Prof. Andrew Vanderburg*

- Developed a Python package titled *eurydice* to perform cross-validation tests on Gaussian Process (GP) models of stellar activity for radial velocity measurements of exoplanets.
- Utilized *eurydice* and MCMC algorithms to optimize a new GP model for the HD 63433 planetary system to further constrain the masses of three planets.

**Instituto de Astrofísica de Canarias**, Tenerife, Spain

January 2025

Visiting Undergraduate Researcher

*Advisor: Dr. Artem Burdanov*

- Operated professional meter-class telescopes (IAC80, Telescopio Carlos Sánchez, and SPECULOOS Artemis) at Teide Observatory during a three-week intensive research course.
- Processed and analyzed photometric data to characterize the variability of the triple brown dwarf system VHS 1256-1257 and rotational light curves of 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

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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*, submitted to the Minor Planet Bulletin
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)

## CONFERENCE PRESENTATIONS

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### Contributed Talks:

MIT Astronomy Field Camp Symposium at the IAC, La Laguna, Tenerife, Spain

January 2025

*Characterizing the Photometric Variability of the Triple Brown Dwarf System VHS1256-1257*

MIT Stellar Contamination Workshop, Cambridge, MA

September 2024

*eurydice: A New Software Package for Evaluating Gaussian Process Models of Stellar Activity Signals*

Summer MIT Kavli Institute Undergraduate Research Forum, Cambridge, MA

August 2024

*eurydice: A New Software Package for Evaluating Gaussian Process Models of Stellar Activity Signals*

## DEPARTMENTAL LEADERSHIP

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### **MIT Undergraduate Women in Physics (UWiP)**

*Co-President*

March 2025 – Present

*Co-Vice President of Social*

March 2024 – March 2025

### **EAPS Undergraduate Council**

*President*

February 2025 – Present

## TEACHING

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### **TA for 12.409 (Hands-On Astronomy: Observing Stars and Planets)**

Spring 2025

Department of Earth, Atmospheric, and Planetary Sciences, MIT

## SKILLS

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**Programming Languages:** Python, MATLAB, LaTeX

**Workshops:** Code/Astro (2024)

**Memberships:** Society of Physics Students, American Physical Society

*Last updated: April 11, 2025*