CALEB K. HARADA

Department of Astronomy
University of California, Berkeley
501 Campbell Hall #3411
Berkeley, CA 94720-3411

charada@berkeley.edu
https://w.astro.berkeley.edu/~charada/

EDUCATION

Ph.D. in Astrophysics — Expected 2026
University of California, Berkeley
Thesis committee:
Prof. Courtney Dressing (chair), Prof. Eugene Chiang, Prof. Jenny Bergner

M.A. in Astrophysics — 2022
University of California, Berkeley

B.S. in Astronomy with High Honors — 2020
University of Maryland, College Park
Magna Cum Laude
Thesis advisor: Prof. Eliza M.-R. Kempton
Thesis: "Signatures of Clouds in Hot Jupiter Atmospheres: Modeled High-Resolution Emission Spectra from 3D General Circulation Models"

B.S. in Physics — 2020
University of Maryland, College Park
Magna Cum Laude

RESEARCH EXPERIENCE

National Science Foundation Graduate Research Fellow — 2020–
Astronomy Department, University of California, Berkeley

Graduate Student Researcher — 2020–
Astronomy Department, University of California, Berkeley

Undergraduate Student Researcher — 2017–2020
Astronomy Department, University of Maryland, College Park

National Science Foundation REU Fellow — Summer 2019
Center for Astrophysics | Harvard & Smithsonian, Cambridge, MA

Undergraduate Student Researcher — Summer 2018
Astronomy Department, University of Michigan, Ann Arbor

Undergraduate Student Researcher — Summer 2017
Department of Astronomy & Astrophysics, University of Chicago

AWARDS & FELLOWSHIPS

National Science Foundation Graduate Research Fellowship	2020–2025
Climatebase Fellowship, Cohort 4 (*declined*)	2023
UC Berkeley Outstanding Graduate Student Instructor Award	2022
University of Maryland President's Scholarship	2016–2020
UMD Physics Angelo Bardasis Memorial Scholarship	2018, 2019, 2020
Maryland Space Grant Scholarship	2019, 2020
UMD Physics Monroe Martin Undergraduate Research Award	2018, 2019
National Science Foundation REU Program Fellowship	2019
University of Maryland University Honors Certificate	2019

REFEREED PUBLICATIONS

First-Author & Significant Contributions

6. **Harada, C. K.**, Dressing, C. D., Kane, S. R., et al., "SPORES-HWO. II. Limits on Planetary Companions of Future High-contrast Imaging Targets from >20 Years of HIRES and HARPS Radial Velocities," *Submitted to AAS Journals*

5. **Harada, C. K.**, Dressing, C. D., Kane, S. R., & Adami Ardestani, B., "Setting the Stage for the Search for Life with the Habitable Worlds Observatory: Properties of 164 Promising Planet Survey Targets," 2024, *ApJS*, 272, 30

4. Desai, A., Turtelboom, E. V., **Harada, C. K.**, et al., "The TESS-Keck Survey. XVIII. A Sub-Neptune and Spurious Long-period Signal in the TOI-1751 System," 2024, *AJ*, 167, 194

3. **Harada, C. K.**, Dressing, C. D., Alam, M. K., et al., "Stability and Detectability of Exomoons Orbiting HIP 41378 f, a Temperate Jovian Planet with an Anomalously Low Apparent Density," 2023, *AJ*, 166, 208

2. Duck, A., **Harada, C. K.**, Harrell, J., Morris, R. A., Williams, E., Crossfield, I., Werner, M., & Deming, D., "K2, Spitzer, and TESS Transits of Four Sub-Neptune Exoplanets" 2021, *AJ*, 162, 136

1. **Harada, C. K.**, M.-R. Kempton, E., Rauscher, E., Roman, M., Malsky, I., Brinjikji, M., & diTomasso, V., "Signatures of Clouds in Hot Jupiter Atmospheres: Modeled High-Resolution Emission Spectra from 3D General Circulation Models," 2021, *ApJ*, 909, 85

Collaborator

11. Mayo, A. W., Fortenbach, C. D., Louie, D. R., Dressing, C. D., Giacalone, S., **Harada, C. K.**, & Turtelboom, E. V., "Detection of H2O and CO2 in the Atmosphere of the Hot Super-Neptune WASP-166b with JWST," *Submitted to AAS Journals*

10. Blunt, S., Nielsen, E. L., Newton, E. R., Daylan, T., **Harada, C. K.**, Kane, S. R., Rice, M., Rodríguez Martínez, R., & Sagynbayeva, S., "Statistical Capability of the Habitable Worlds Observatory for Constraining Ozone Onset Time in Earth Analogs," *Submitted to JATIS*

9. Wittenmyer, R. A., Errico, A., Holt, T. R., Horner, J., **Harada, C. K.**, Kane, S. R., & Li, Z., "Optimising Radial Velocity Detection Limits for Southern Habitable Worlds Observatory Targets," *Submitted to MNRAS*

8. Dressing, C. D., Savel, A. B., Giacalone, S., et al. (including **Harada, C. K.**), "Cleaning up the TOIs I: ShARCS Follow-up Adaptive Optics Imaging of 603 TESS Targets," *Submitted to AAS Journals*

7. Turtelboom, E. V., Dietrich, J., Dressing, C. D., & **Harada, C. K.**, "Searching for Additional Planets in TESS Multi-Planet Systems: Testing Empirical Models Based on Kepler Data," *Submitted to AAS Journals*

6. Kane, S. R., Li, Z., Turnbull, M. C., Dressing, C. D., & **Harada, C. K.**, "Dynamical Viability Assessment for Habitable Worlds Observatory Targets," 2024, *AJ*, 168, 195

5. Turtelboom, E. V., Weiss, L. M., Dressing, C. D., et al. (including **Harada, C. K.**), "The TESS-Keck Survey. XI. Mass Measurements for Four Transiting Sub-Neptunes Orbiting K-dwarf TOI 1246," 2022, *AJ*, 163, 293

4. Malsky, I., Rauscher, E., M.-R. Kempton, E., Roman, M., Long, D., & **Harada, C. K.**, "Modeling the High-Resolution Emission Spectra of Clear and Cloudy Nontransiting Hot Jupiters," 2021, *ApJ*, 923, 62

3. Roman, M. T., M.-R. Kempton, E., Rauscher, E., **Harada, C. K.**, Bean, J. L., & Stevenson, K. B., "Clouds in Three-Dimensional Models of Hot Jupiters Over a Wide Range of Temperatures I: Thermal Structures and Broadband Phase Curve Predictions," 2021, *ApJ*, 908, 101

2. Vissapragada, S., Knutson, H. A., Jovanovic, N., **Harada, C. K.**, Oklopčić, A., Eriksen, J., Mawet, D., Millar-Blanchaer, M. A., Tinyanont, S., & Vasisht, G., "Constraints on Metastable Helium in the Atmospheres of WASP-69b and WASP-52b with Ultra-Narrowband Photometry," 2020, *AJ*, 159, 278

1. Collins, K. A., Collins, K. I., Pepper, J., et al. (including **Harada, C. K.**), "The KELT Follow-Up Network and Transit False Positive Catalog: Pre-vetted False Positives for TESS," 2018, *AJ*, 156, 234

SUCCESSFUL OBSERVING PROPOSALS

Principle Investigator

10-m Keck I Telescope

"Confirming an Eccentric Sub-Saturn Planet Around the Bright Nearby Star HD 219623," Program ID 2025A_U261 (KPF, 0.25 nights)

2.4-m Automated Planet Finder (APF), Lick Observatory

"Probing Planetary System Architectures Around Neglected Nearby Stars in Preparation for HWO," Program ID 2025A_A009 (Levy, 3 nights)

Co-Investigator

NASA James Webb Space Telescope (JWST)

"Transmission Spectroscopy of the Super-Neptune WASP-166b," Cycle 1 GO Program ID 2062 (NIRISS/NIRSpec, 22.8 hours; PI: Mayo)

10-m Keck I Telescope

"The Obliquity of the HIP 41378 Planetary System," Program ID 2022B_U089 (HIRES, 18.0 hours; PI: Dressing)

8.1-m Gemini-N Telescope

"Characterizing TOI 2104, one of the highest-multiplicity TESS systems," Program ID GN-2024B-Q-123 (MAROON-X, 19.8 hours; PI: Turtelboom)

3.5-m WIYN Telescope

"Characterizing TOI 2104, one of the highest-multiplicity TESS systems," Program ID 2024B-662476 (NEID, 17.5 hours; PI: Turtelboom)

3-m Shane Telescope, Lick Observatory

"Looking for Close Stellar Companions to Potential Targets for Future Searches for Life with the Habitable Worlds Observatory," Program ID 2025A_S025 (ShARCS, 5 nights; PI: Dressing)

"A Closer Look at the Host Stars of Transiting Planets," Program ID 2022A_S014 (ShARCS, 5 nights; PI: Dressing)

"A Closer Look at the Host Stars of Transiting Planets," Program ID 2021B_S009 (ShARCS, 8 nights; PI: Dressing)

"A Closer Look at the Host Stars of Transiting Planets," Program ID 2021A_S020 (ShARCS, 12 nights; PI: Dressing)

2.4-m Automated Planet Finder (APF), Lick Observatory

"The APF Survey of the Habitable Worlds Observatory's Neglected Targets," Program ID 2025A_A011 (Levy, 3 nights; PI: Holden)

1-m Nickel Telescope, Lick Observatory

"Validating Netpune-size planets around A-type stars," Program ID 2022B_N011 (Direct Imaging Camera, 5 nights; PI: Giacalone)

"Validating Netpune-size planets around A-type stars," Program 2022A_N005 (Direct Imaging Camera, 18 nights; PI: Giacalone)

"Validating Netpune-size planets around A-type stars," Program 2021B_N001 (Direct Imaging Camera, 20 nights; PI: Giacalone)

SELECTED TALKS & POSTERS

Invited Talks

Yale Exoplanets and Stars Seminar, New Haven, CT, October 30, 2024
"Habitable Worlds Observatory: Precursor Science for an Exo-Earth Survey"

MIT Kavli Institute Monday Afternoon Talk, Cambridge, MA, October 28, 2024
"Precursor Science for the Habitable Worlds Observatory: Pathways to Planet Properties"

HWO Splinter Session, AAS #243, New Orleans, LA, January 10, 2024
"A Pathway to Planet Properties: Maximizing Precursor Knowledge of Potential HWO Targets"

UC Santa Cruz Planetary Lunch Talk, Santa Cruz, CA, October 31, 2022
"Two Tales from the Crypt: Signatures of Clouds in Hot Jupiter Ahhh!-tmospheres & Dynamical Stability of ExomoOoOons"

Contributed Talks

AAS Meeting #245, National Harbor, MD, January 15, 2025
"SPORES-HWO: Precursor Science for the HWO Exo-Earth Survey"

AAS Meeting #243, New Orleans, LA, January 10, 2024
"Stability of exomoons orbiting HIP 41378 f, a temperate super-puff in a multi-planet system"

UC Berkeley Astronomy Lunch Talk, Berkeley, CA, October 20, 2022
"Stability of exomoons orbiting HIP 41378 f, a temperate super-puff in a multi-planet system"

Bay Area Exoplanet Meeting #36, Remote/NASA Ames, March 5, 2021
"Cloudy Hot Jupiters: Predictions of High-resolution Thermal Emission Spectra"

University of Maryland Exoplanets Meeting, College Park, MD, October 2, 2019
"Atmospheric Escape in Exoplanets: Simulated 10830 Å Helium Line Absorption"

SAO/CfA Summer REU Symposium, Cambridge, MA, August 8, 2019
"Atmospheric Escape in Exoplanets: Simulated 10830 Å Helium Line Absorption"

UMD Astronomy Summer Research Talk, College Park, MD, September 14, 2018
"Simulated Emission Spectra of Hot Jupiters with Cloudy Atmospheres"

UChicago Astronomy Summer Research Talk, Chicago, IL, August 18, 2017
"Photometry of M-Dwarf Binaries in Young Moving Groups"

Public Talks

UC Berkeley Compass Project Lecture, Berkeley, CA, October 25, 2024
"The Search for Habitable Worlds"

Scientist in Every Florida School, Remote/Miami, FL, October 7, 2024
"What's in the Night Sky?"

UMD Observatory Open House, College Park, MD, December 5, 2017
"Exploring the Cepheid Period-Apparent-Magnitude Relation in M31 with iPTF"

Posters

Harada, C. K., Dressing, C. D., & Kane, S. R., "System Properties and Observational Reconnaissance for Exoplanet Studies with the Habitable Worlds Observatory," Know Thy Star; Know Thy Planet Conference 2, Caltech Campus, Pasadena, CA, February 3-7, 2025

Tuchow, N., Mamajek, E., **Harada, C. K.**, & Tanner, A., "Identifying Likely HWO Targets: Report from the HWO Catalogs and Databases Task Group," Know Thy Star; Know Thy Planet Conference 2, Caltech Campus, Pasadena, CA, February 3-7, 2025

Mayo, A. W., Fortenbach, C. D., Louie, D. R., Dressing, C. D., Giacalone, S., **Harada, C. K.**, & Turtelboom, E., "Detection of H_2O and CO_2 in the Atmosphere of the Hot Super-Neptune WASP-166b with JWST," Know Thy Star; Know Thy Planet Conference 2, Caltech Campus, Pasadena, CA, February 3-7, 2025

Harada, C. K., Dressing, C. D., & Kane, S. R., "SPORES-HWO II. Assessing Sensitivity Limits on Planetary Architectures with a Uniform Analysis of Radial Velocities," (digital poster), NExScI Sagan Summer Workshop, Caltech Campus, Pasadena, CA, July 22–26, 2024

Harada, C. K., Dressing, C. D., & Kane, S. R., "SPORES-HWO II. Assessing Sensitivity Limits on Planetary Architectures with a Uniform Analysis of Radial Velocities," Exoplanets 5, Leiden, the Netherlands, June 20, 2024

Harada, C. K., Dressing, C. D., & Kane, S. R., "Habitable Worlds Observatory SPORES: Stellar Properties & Observational Reconnaissance for Exoplanet Studies," Extreme Solar Systems V, Ōtautahi/Christchurch, Aotearoa/New Zealand, March 17–21, 2024

Adami Ardestani B., **Harada, C. K.**, & Dressing, C. D., "Habitable Worlds Observatory: Synthesizing Knowledge of Target Stars to Prepare for the Search for Habitable Exoplanets" (iPoster), AAS Meeting #243, New Orleans, LA, January 11, 2024

Mayo, A., **Harada, C. K.**, & Dressing, C. D., "Enriching Out View of Multiplanet Systems with High-Cadence Observations of 914 TESS Targets" (digital poster), NExScI Sagan Summer Workshop, Remote/Pasadena, CA, July 25, 2023

Hellum Bye, C., Eiden, K., Gardiner, E., **Harada, C. K.**, Isaacson, H., & Sandford, N., "Organizing in Astronomy and Academia: Tales from UCB Astronomy" (iPoster), AAS Meeting #241, Seattle, WA, January 9, 2023

Harada, C. K., & Oklopčić, A., "New Insights into the Escaping Atmospheres of HAT-P-11b and WASP-69b: Simulated 10830 Å Helium Line Transmission Spectra" (ADS abstract), AAS Meeting #235, Honolulu, HI, January 6, 2020

Harada, C. K., M.-R. Kempton, E., Rauscher, E., & Roman, M., "Simulated Emission Spectra of Hot Jupiters with Active Clouds from 3D GCMs," Chesapeake Bay Area Exoplanet Meeting, College Park, MD, February 15, 2019

Harada, C. K., M.-R. Kempton, E., Rauscher, E., & Roman, M., "Simulated Emission Spectra of Hot Jupiters with Active Clouds from 3D GCMs" (ADS abstract), AAS Meeting #233, Seattle, WA, January 8, 2019

Duck, A. E., **Harada, C. K.**, Harrell, J., Williams, E., Morris, R. A., Deming, D., Werner, M., & Crossfield, I., "K2 and Spitzer Joint Analysis of 4 Transiting Exoplanets" (ADS abstract), AAS Meeting #233, Seattle, WA, January 8, 2019

Harada, C. K., & Warner, E., "KELT-FUN: Hunting for Hot Exoplanets at the UMD Observatory," University of Maryland Undergraduate Research Day, College Park, MD, April 25, 2018

PROFESSIONAL SERVICE

Task Group Liaison, NASA HWO Exoplanet Demographics Working Group, 2024–

Task Group Lead, NASA HWO Target Stars & Systems Working Group, 2024–

Astro-Q Coordinator, UC Berkeley Astronomy Department, 2023–

Judge, AAS Chambliss Poster Competition, AAS Meeting #245, January 2025

Facilitator, Berkeley MPS Scholars Undergrad Research Workshop, December 3, 2024

Panelist, Berkeley MPS Scholars NSF GRFP Workshop, October 8, 2024

Panelist, Berkeley MPS Scholars Grad Application Workshop, August 22, 2024

Judge, AAS Chambliss Poster Competition, AAS Meeting #243, January 2024

Grad Student Representative, UCB Astronomy DEI/Climate Committee, 2021–2022

Member, SRU/UAW-2865 Astronomy Organizing Committee, Fall 2022

Facilitator, UCB Queer Grads in Astronomy Info Session, March 17, 2022

Panel Chair, UCB Astronomy Prospective Grad Visit Q&A Panel, March 18, 2021

Member, UCB Astronomy Prospective Grad Visit Planning Committee, Spring 2021

Member, University of Michigan Astronomy DEI Committee, Summer 2018

TEACHING & MENTORING

Classroom Experience

Astro-7A: Introduction to Astrophysics, UC Berkeley (UG/majors)
Guest Lecturer, November 14, 2024
Guest Lecturer, September 5, 2023
Guest Lecturer, October 18, 2022
Graduate Student Instructor, Fall 2021

Astro-C12: The Planets, UC Berkeley (UG/non-majors)
Head Graduate Student Instructor, Spring 2023

EPS-C181: Atmospheric Physics and Dynamics, UC Berkeley (UG/majors)
Course Reader, Fall 2022

Astro-121: Introductory Astrophysics II, University of Maryland (UG/majors)
Lab Teaching Assistant, Spring 2020
Course Tutor, Spring 2018

Astro-310: Observational Astronomy, University of Maryland (UG/majors)
Lab Teaching Assistant, Fall 2019
Lab Teaching Assistant, Fall 2018

Mentorship Programs

Mathematical & Physical Sciences (MPS) Scholars Program, UC Berkeley, 2024–

Cal-Bridge Tutoring Program, UC Berkeley, 2024–

POWER Bay Area Organizing Committee, UC Berkeley, 2022–2023

Society for Women in the Physical Sciences (SWPS), UC Berkeley, 2022

Astronomy Peer Mentoring (APM) Program, University of Maryland, 2018–2020

Co-advised Undergraduate Students

Bahareh Adami Ardestani (Sonoma State University undergraduate, began 2023)

Ryan Hwangbo (UC Berkeley undergraduate, began 2023)

Anmol Desai (UC Berkeley undergraduate, began 2022)

OUTREACH

Pen Pal, Letters to a Pre-Scientist, 2024–

Guest Speaker, Scientist in Every Florida School, 2024

Mentor Coordinator, POWER Bay Area (UCB), 2022-2023

Open House Volunteer/Staff, University of Maryland Observatory, 2016–2020

Astronomy Outreach Volunteer, Maryland Day, University of Maryland, 2017–2019

Contributing Speaker, *Physics is Fun!*, University of Maryland, 2016

Updated February 2025