Abigail J. Lee

Email: abby.lee@berkeley.edu • Website: abiglee7.github.io

Education & Appointments

University of California, Berkeley Aug 2025 – Present
NHFP Hubble Fellow (Aug 2025 – Jul 2026)
Miller Research Fellow (Aug 2026 – Jul 2029)

University of Chicago May 2025
Ph.D. in Astronomy & Astrophysics
Certificate in College Teaching
Advised by Wendy Freedman

University of Pennsylvania May 2019
B.A. in Physics *summa cum laude* with Departmental Honors
Minors in Classical Studies and Mathematics
Advised by Gary Bernstein

Awards & Fellowships

Miller Research Fellowship	2025-2029
NHFP Hubble Fellowship	2025-2026
CCAPP Price Prize in Cosmology and AstroParticle Physics	2024
AGB Stars Prize for Young Researchers, XIV Torino Workshop on AGB Stars	2024
Future Investigators in NASA Earth and Space Science and Technology (FINESST)	2022-2025
Illinois Space Grant Consortium Graduate Fellowship	2022-2023
LSST Coorporation Data Science Fellowship	2021-2023
Chambliss Astronomy Achievement Award	2021
Elaine K. Bernstein Women in Science Award, UChicago	2019
McCormick Graduate Fellowship, UChicago	2019-2021
NASA Pennsylvania Space Grant Undergraduate Scholarship	2018
University Scholar, Penn	2015-2019

Previous Research Positions

Graduate Research Assistant, UChicago	2019 – 2025
Summer Visiting Researcher, Seoul National University	2023
Undergraduate Research Assistant (Cosmology), Penn	2017 – 2019
Summer Undergraduate Research Assistant, Stanford/KIPAC	2018
Summer Undergraduate Researcher, Max Planck Institute for Gravitational Physics	2017
Summer Intern, NASA Jet Propulsion Laboratory	2017
Undergraduate Research Assistant (Experimental Condensed Matter), Penn	2016 – 2017

Observing Proposals & Grants

Summary: Awarded $1.4 million in competitive funding as PI

As Principal Investigator/Submitter

James Webb Space Telescope

- "J-Virgo: A JWST Treasury Survey of the Virgo Cluster", co-PI with Daniel Weisz, 147 hours (NIRCam) / 67 hours (NIRISS), $673,498, 2025

Hubble Space Telescope

- "Quantifying Systematics in the JAGB Method Distance Scale in M33", Archival, $19,678, 2023
- "Quantifying Systematics in the JAGB Method Distance Scale in M31", Archival, $30,886, 2022

Full Stipendiary Grants

- NASA Hubble Fellowship, "AGB Stars in the Era of NIR Astronomy: New Probes of Cosmology and Galaxy Evolution", $148,059, 2025-2026
- Miller Research Fellowship, "AGB Stars in the Era of IR Astronomy: New Probes of Cosmology and Galaxy Evolution", $354,000, 2026-2029
- NASA FINESST, "Measuring the Hubble Constant with Carbon Stars", $150,000, 2022-2025

Magellan-Baade Telescope (FourStar)

- "JAGB and TRGB Distances to Three New Galaxies", 3 nights, 2024B

As Co-Investigator

NASA Euclid General Investigator Program (PI: A. Savino), 2025
James Webb Space Telescope GO-1995 (PI: W. Freedman), 2021
UChicago Midway Research II Computing Allocation (PI: J. Frieman), 123k hours, 2021
Hubble Space Telescope AR-16126 (PI: W. Freedman), 2020
Hubble Space Telescope AR-16127 (PI: W. Freedman), 2020

Publications

FIRST-AUTHOR PUBLICATIONS

1. **Lee, A. J.**, Weisz, D. R., Savino, A., Dolphin, A. *Measuring Star Formation Histories from Asymptotic Giant Branch Stars II: Validation in WLM*, 2026, in preparation

2. **Lee, A. J.**, Weisz, D. R., Ren, Y., Savino, A., Dolphin, A. *Measuring Star Formation Histories from Asymptotic Giant Branch Stars I: A Demonstration in M31*, 2025b, ApJ, 995, 135

3. **Lee, A. J.**, Freedman, W. L., Madore, B. F., Jang, I. S., Owens, K. A., Hoyt, T. J. *The Chicago-Carnegie Hubble Program: The JWST J-region Asymptotic Giant Branch (JAGB) Extragalactic Distance Scale*, 2025a, ApJ, 985, 182

4. **Lee, A. J.**, Monson, A. J., Freedman, W. L., Madore, B. F., Owens, K. A., Beaton, R. L., Espinoza, C., Ren, T., Ren, Y. *Resolved Near-infrared Stellar Photometry from the Magellan Telescope for 13 Nearby Galaxies: JAGB Method Distances*, 2024b, ApJ, 967, 22

5. **Lee, A. J.**, Freedman, W. L., Jang, I. S., Madore, B. F., Owens, K. A. *First JWST Observations of JAGB Stars in the SN Ia host galaxies: NGC 7250, NGC 4536, NGC 3972*, 2024a, ApJ, 961, 132

6. **Lee, A. J.** *Carbon Stars as Standard Candles: An Empirical Test for the Metallicity, Age, and Reddening Sensitivity of the J-region Asymptotic Giant Branch (JAGB) Method*, 2023, ApJ, 956, 15

7. **Lee, A. J.**, Rousseau-Nepton, L., Freedman, W. L., Madore, B. F., Cioni, M.-R., Hoyt, T. J., Jang, I. S., Javadi, A., Owens, K. A. *The Astrophysical Distance Scale: V. A 2% Distance to the Local Group Spiral M33 via the JAGB Method, Tip of the Red Giant Branch, and Leavitt Law*, 2022, ApJ, 933, 201

8. **Lee, A. J.**, Freedman, W. L., Madore, B. F., Owens, K. A., Jang, I. S. *A Preliminary Calibration of the JAGB Method Using Gaia EDR3*, 2021b, ApJ, 923, 157

9. **Lee, A. J.**, Freedman, W. L., Madore, B. F., Owens, K. A., Monson, A. J., Hoyt, T. J. *The Astrophysical Distance Scale III: Distance to the Local Group Galaxy WLM using Multi-Wavelength Observations of the Tip of the Red Giant Branch, Cepheids, and JAGB Stars.* 2021a, ApJ, 907 112

CO-AUTHOR PUBLICATIONS

1. Owens, K. A., Jang, I. S., Freedman, W. L., Hoyt, T. J., **Lee, A. J.**, Madore, B. F., Monson, A. J. *Investigating the Extragalactic Distance Scale with JWST: Cepheids in NGC 7250*, 2025, submitted to ApJ

2. Hoyt, T. J., Jang, I. S., Freedman, W. L., Madore, B. F., Owens, K. A., **Lee, A. J.**. *The Chicago Carnegie Hubble Program: Improving the Calibration of SNe Ia with JWST Measurements of the Tip of the Red Giant Branch*, 2025, arXiv:2503.11769, accepted to ApJ

3. Freedman, W. L., Madore, B. F., Jang, I. S., Hoyt, T. J., **Lee, A. J.**, Owens, K. A. *Status Report on the Chicago-Carnegie Hubble Program (CCHP): Measurement of the Hubble Constant Using the Hubble and James Webb Space Telescopes*, 2025, ApJ, 985, 203

4. Freedman, W. L., Madore, B. F., Hoyt, T. J., Jang, I. S., **Lee, A. J.**, Owens, K. A. *I-Band Asymptotic Giant Branch (IAGB) Stars: II. A First Estimate of their Precision and a Differential Zero Point*, 2025, AJ, 169, 247

5. Madore, B. F., Freedman, W. L., Hoyt, T. J., Jang, I. S., **Lee, A. J.**, Owens, K. A. *I-Band Asymptotic Giant Branch (IAGB) Stars: I. Exploring a New Standard Candle for the Extragalactic Distance Scale*, 2025, AJ, 169, 162

6. Hoyt, T. J., Jang, I. S., Freedman, W. L., Madore, B. F., **Lee, A. J.**, Owens, K. A. *Coordinated JWST Imaging of Three Distance Indicators in a SN Host Galaxy and an Estimate of the TRGB Color Dependence*, 2024, ApJ, 975, 111

7. Porth, L., Bernstein, G., Smith, R. E., **Lee, A. J.** *The Information Content of Projected Galaxy Fields*, 2022, MNRAS, 518, 3344

8. Madore, B. F., Freedman, W. L., **Lee, A. J.**, Owens, K. A. *Milky Way Zero-Point Calibration of the JAGB Method: Carbon Stars in Galactic Open Clusters*, 2022, ApJ, 938, 125

9. Owens, K. A., Freedman, W. L., Madore, B. F., **Lee, A. J.** *Current Challenges in Cepheid Distance Calibrations Using Gaia EDR3*, 2022, ApJ, 927, 8

10. Madore, B. F., Freedman, W. L., **Lee, A. J.** *Astrophysical Distance Scale IV. Preliminary Zero-Point Calibration of the JAGB Method in the HST/WFC3-IR Broad J-Band (F110W) Filter.* 2022, ApJ, 926, 153

11. Vishnubhotla, R., Ping. J., Gao, Z., **Lee, A.**, Saouaf, O., Vrudhula, A., Johnson, A. T. C. *Scalable Graphene Aptasensors for Drug Quantification* 2017, AIP Advances 7, 115111

NON-REFEREED MANUSCRIPTS

1. Kraemer, K., et al. including **Lee, A. J.**, *Setting the Stage for Improving the Distance Ladder with Roman Core Community Surveys*, 2023, White Paper submitted to the Roman Core Community Survey

2. **Lee, A. J.**, et al. *Predicting Winners of the Reality TV Dating Show The Bachelor Using Machine Learning Algorithms*, 2022, April Fools arXiv paper

Invited Talks

***Talk** The stellar route to H_0: not only Classical Cepheids, Switzerland	Jul 2026
Seminar UC Davis	Dec 2025
Plenary Observational Tensions in Cosmology, Naples	May 2025
Seminar Florida State University	Apr 2025
Seminar Washington University in St. Louis	Jan 2025
Plenary CERN EuCAPT online Rapid Response Workshop on H_0	Sep 2024
Seminar LSST Dark Energy Science Collaboration (DESC) seminars	Sep 2024
Price Prize Seminar The Ohio State University/CCAPP	Aug 2024
Talk Giant Branch Distance Scale Workshop, STScI	Nov 2023
Seminar Seoul National University	Sep 2023
Talk MIAPbP workshop on the extragalactic distance scale, Munich	Jul 2023
Seminar University of Pennsylvania	Oct 2022
Talk Argonne National Lab	Oct 2021

Contributed Conference Talks & Posters

Talk NHFP Symposium, Baltimore	Oct 2025
Dissertation Talk AAS 245, National Harbor	Jan 2025
Talk XIV Torino Workshop on AGB stars, Rome	Jun 2024
Poster Science with HST and JWST VII, Porto	Apr 2024
Talk AAS 243, New Orleans	Jan 2024
Talk AAS 241, Seattle	Jan 2023
Talk AAS 240, Pasadena	Jun 2022
Poster AAS 237 (Winner of Chambliss Award)	Jan 2021
Talk Gulf Coast Undergraduate Research Symposium, Houston	Nov 2017
Talk Emerging Researchers National Conference in STEM, D.C.	Mar 2017

*Upcoming

Research Advising

Coral Espinoza, Lake Forest College (LFC) undergraduate — 2022 – 2023
Oversaw UChicago REU summer project and LFC senior thesis

Teaching

Guest Lecturer, UChicago, *Physics of Stars*	2023
Guest Lecturer, UChicago, *Galaxies*	2020
Teaching Assistant, UChicago, *Galaxies*	2020
Teaching Assistant, UChicago, *Stars*	2019
Teaching Assistant, Penn, *Classical Mechanics*	2019
Observing Labs Teaching Assistant, Penn, *Survey of the Universe*	2018, 2019
Teaching Assistant, Penn, *E&M, Optics, and Modern Physics*	2018
Lab Teaching Assistant, Penn, *Classical Mechanics*	2017
Tutor, Penn Physics Department	2016, 2017

Observing

Public data – significant experience with data from JWST, HST, Gaia, 2MASS, VMC

Magellan/FourStar Imaging - 20 nights
Magellan/IMACS Imaging - 1 night
Magellan/IMACS Spectroscopy - 1 night

Collaboration Membership

Roman Science Collaboration, Nearby Galaxies Working Group
Roman Infrared Nearby Galaxies Survey (RINGS)
J-Virgo: A *JWST* Treasury Survey of the Virgo Cluster
Chicago-Carnegie Hubble Program (CCHP)

Press

Expertise Interviews:

- PopSci, Is the universe really infinite?
- PopSci, JWST takes a jab at the mystery of the universe's expansion rate

Selected press featuring Lee et al. 2025a:

- Quanta, *The Webb Telescope Further Deepens the Biggest Controversy in Cosmology*
- Dr. Becky YouTube Channel, *JWST turned the Crisis in Cosmology into a bigger problem*
- Dr. Becky YouTube Channel, *Has JWST SOLVED the crisis in cosmology?!*

Press featuring Lee et al. 2021a:

- UChicago News, *Aging stars provide a new cosmological yardstick*

Selected Outreach and EDI

Referee for ApJ, ApJL, A&A
Reviewer for international funding proposals

Youtube "Cosmology Talks" "Extragalactic distances from the JAGB method"	2024
Public Talk "The Expansion of the Universe", Lake Forest Astronomy Club	2022
Public Talk "Mentorship in Academia", UChicago Physics of Stars highschool class	2021

Bay Area Scientists Inspiring Students (BASIS)	2025 – Present
AMP-UP Mentor for 2 PhD students	2025 – Present
Astrobites, my articles (Ombudsperson 23-25, Hiring Committee 23-24)	2022 – 2025
Inclusion, Diversity and Equity in Astronomy, UChicago, (Organizer 22-24)	2019 – 2025
UChicago Empowerment of North Koreans (ENOK), English Tutor	2022 – 2023
Advising & Mentoring Program, UChicago, Organizer	2020 – 2023
Peer Mentor for 3 PhD Students, UChicago	2020 – 2023
Chambliss Award Judge	2022
Space Explorers Winter Institute Instructor, UChicago	2020
Observing Nights Organizer, Penn	2018 – 2019
Penn Veterans Upward Bound, Astronomy Tutor for Veterans	2018 – 2019

Department committees and responsibilities

Galaxy Formation (GalForm) Group, Organizer, Berkeley	2025 – Present
Graduate Admissions Committee, UChicago	2024 – 2025
Climate Survey Committee, Student Representative, UChicago	2021 – 2024
Faculty Meeting Graduate Student Representative, UChicago	2019 – 2020
Society of Physics Students, Social Chair, Penn	2018 – 2019

Other Activities

Languages: English (native), Spanish (intermediate), Korean (basic)	
Rec Soccer, play in several high-level (college experience) leagues 3x/week	2019 – Present
Semi-professional Women's Soccer (WPSL, WMLIS)	2023 – 2025
Penn Women's Club Soccer Team	2015 – 2019
Penn Symphony Orchestra, first violin	2015 – 2019