

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 <i>summa cum laude</i> with Departmental Honors | |
| Minors in Classical Studies and Mathematics | |
| Advised by Gary Bernstein | |

AWARDS & FELLOWSHIPS

| | |
|---|------|
| NHFP Hubble Fellowship | 2025 |
| Miller Research Fellowship , UC Berkeley Miller Institute | 2025 |
| Brinson Prize Fellowship (declined) | 2025 |
| CCAPP Price Prize | 2024 |
| <i>Recognizes research excellence and exceptional promise in a PhD student in cosmology and astroparticle physics</i> | |
| AGB Stars Prize for Young Researchers , XIV Torino Workshop on AGB Stars | 2024 |
| <i>Awarded to a young scientist providing a remarkable contribution to AGB star research</i> | |
| Future Investigators in NASA Earth and Space Science and Tech. (FINESST) | 2022 |
| Illinois Space Grant Consortium Graduate Fellowship | 2022 |
| LSST Coorporation Data Science Fellowship | 2021 |
| Chambliss Astronomy Achievement Award , 237th Meeting of the AAS | 2021 |
| <i>Awarded to the top graduate student posters at the AAS meeting</i> | |
| Elaine K. Bernstein Women in Science Award , University of Chicago | 2019 |
| McCormick Graduate Fellowship , University of Chicago | 2019 |
| NASA Pennsylvania Space Grant Undergraduate Scholarship | 2018 |
| University Scholar , Penn | 2015 |

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 pending approval, 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

PREVIOUS RESEARCH POSITIONS

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

INVITED TALKS

| | |
|--|----------|
| *Seminar UC Davis | Dec 2025 |
| Seminar Florida State University | Apr 2025 |
| Plenary Observational Tensions in Cosmology, Naples | May 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 distance scale, Munich | Jul 2023 |
| Seminar University of Pennsylvania | Oct 2022 |
| Talk Argonne National Lab | Oct 2021 |

CONTRIBUTED TALKS & POSTERS

| | |
|---|----------|
| *Talk AAS 247, Phoenix | Jan 2026 |
| 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

PUBLICATIONS

FIRST AND SINGLE AUTHOR PUBLICATIONS

1. Lee, A. J., Weisz, D. R., Ren, Y., Savino, A., Dolphin, A. *Measuring Star Formation Histories from Asymptotic Giant Branch Stars: A Demonstration in M31*, 2025b, [arXiv:2410.09256](https://arxiv.org/abs/2410.09256), in Press at ApJ
2. 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](https://doi.org/10.3847/1538-3881/acca3e)
3. 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](https://doi.org/10.3847/1538-3881/acca3e)
4. 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](https://doi.org/10.3847/1538-3881/acca3e)
5. 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](https://doi.org/10.3847/1538-3881/acca3e)
6. 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](https://doi.org/10.3847/1538-3881/acca3e)
7. 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](https://doi.org/10.3847/1538-3881/acca3e)
8. 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](https://doi.org/10.3847/1538-3881/acca3e)

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](https://arxiv.org/abs/2503.11769), submitted 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](https://doi.org/10.3847/1538-3881/acca3c)
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](https://doi.org/10.3847/1538-3881/acca3c)
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](https://doi.org/10.3847/1538-3881/acca3c)
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](https://doi.org/10.3847/1538-3881/acca3c)
7. Porth, L., Bernstein, G., Smith, R. E., **Lee, A. J.** *The Information Content of Projected Galaxy Fields*, 2022, [MNRAS, 518, 3344](https://doi.org/10.1093/mnras/stab270)
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](https://doi.org/10.3847/1538-3881/acca3c)
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](https://doi.org/10.3847/1538-3881/acca3c)
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](https://doi.org/10.3847/1538-3881/acca3c)
11. Vishnubhotla, R., Ping, J., Gao, Z., **Lee, A. J.**, Saouaf, O., Vrudhula, A., Johnson, A. T. C. *Scalable Graphene Aptasensors for Drug Quantification* 2017, [AIP Advances 7, 115111](https://doi.org/10.1063/1.4983770)

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](#)

RESEARCH ADVISING

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

2022 – 2023

TEACHING EXPERIENCE

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

OBSERVING EXPERIENCE

Public data – significant experience with data from JWST, HST, Gaia, 2MASS, VMC
Magellan-Baade FourStar near-infrared imaging - 20 nights
Magellan-Baade IMACS optical imaging - 1 night
Magellan-Baade IMACS optical spectroscopy - 1 night

COLLABORATION MEMBERSHIP

| | |
|---|-------------|
| <i>Roman</i> Infrared Nearby Galaxies Survey (RINGS) | 2025 – |
| J-Virgo: A <i>JWST</i> Treasury Survey of the Virgo Cluster | 2024 – |
| Chicago-Carnegie Hubble Program (CCHP) | 2019 – 2025 |

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](#)

PROFESSIONAL SERVICE

| | | |
|--|--|----------------|
| Referee for ApJ, ApJL, A&A | | |
| Organizer , Berkeley Galaxy Formation (GalForm) Group | | 2025 – Present |
| UChicago Graduate Admissions Committee Member , UChicago | | 2024 – 2025 |
| Mentor to NASA FINESST applicants , UChicago | | 2023 – 2025 |
| Organized two workshops to help PhD students apply to the FINESST | | |
| AAS 242 Chambliss Judge | | 2022 |
| UChicago Empowerment/Emancipation of North Koreans (ENOK) , English tutor | | 2022 – 2023 |
| Climate Survey Committee Member , UChicago | | 2021 – 2024 |
| Faculty Meeting Graduate Student Representative , UChicago | | 2019 – 2020 |
| Society of Physics Students Board Member , Penn | | 2018 – 2019 |

OUTREACH, EQUITY, & INCLUSION

| | |
|--|----------------|
| Astronomy Mentoring Program for Upcoming Postdocs (AMP-UP) | 2025 – Present |
| Mentees: Ashley Elliott, Ashley Walker | |
| Writer , Astrobites (find my articles here) | 2022 – 2025 |
| Ombudsperson (2023 – 2025), Hiring Committee (2023 – 2024) | |
| Inclusion, Diversity and Equity in Astronomy Club , UChicago | 2019 – 2025 |
| Organizer (2022 – 2024) | |
| Advising & Mentoring Program Organizer and Mentor , UChicago | 2020 – 2023 |
| Mentored three UChicago PhD students (2020 – 2025) | |
| Public Lectures & Outreach Talks | |
| Cosmology Talks Youtube, <i>Extragalactic distances from the JAGB method</i> | 2024 |
| Lake Forest College astronomy club, <i>The Expansion of the Universe</i> | 2022 |
| UChicago <i>Physics of Stars</i> summer HS class, <i>Mentorship in Academia</i> | 2021 |
| Space Explorers Winter Institute Instructor , UChicago | 2020 |
| Observing Nights Organizer , Penn | 2018 – 2019 |
| Astronomy Tutor for Veterans , Penn Veterans Upward Bound | 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 |
| University of Pennsylvania Womens's Club Soccer Team | 2015 – 2019 |
| Treasurer (2015 – 2017) | |
| University of Pennsylvania Symphony Orchestra , first violin | 2015 – 2019 |