

# Abigail J. Lee

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## EDUCATION & APPOINTMENTS

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<b>University of California, Berkeley</b>	Aug 2025 – Present
NHFP Hubble Fellow (Aug 2025 – Jul 2026)	
Miller Research Fellow (Aug 2026 – Jul 2029)	
<b>University of Chicago</b>	May 2025
Ph.D. in Astronomy & Astrophysics	
Certificate in College Teaching	
Advised by Wendy Freedman	
<b>University of Pennsylvania</b>	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

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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 Corporation 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

## OBSERVING PROPOSALS & GRANTS

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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

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## PREVIOUS RESEARCH POSITIONS

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

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## INVITED TALKS

<b>Seminar</b> UC Davis	Dec 2025
<b>Plenary</b> Observational Tensions in Cosmology, Naples	May 2025
<b>Seminar</b> Florida State University	Apr 2025
<b>Seminar</b> Washington University in St. Louis	Jan 2025
<b>Plenary</b> CERN EuCAPT online Rapid Response Workshop on $H_0$	Sep 2024
<b>Seminar</b> LSST Dark Energy Science Collaboration (DESC) seminars	Sep 2024
<b>Price Prize Seminar</b> The Ohio State University/CCAPP	Aug 2024
<b>Talk</b> Giant Branch Distance Scale Workshop, STSCI	Nov 2023
<b>Seminar</b> Seoul National University	Sep 2023
<b>Talk</b> MIAPbP workshop on the distance scale, Munich	Jul 2023
<b>Seminar</b> University of Pennsylvania	Oct 2022
<b>Talk</b> Argonne National Lab	Oct 2021

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## CONTRIBUTED CONFERENCE TALKS & POSTERS

<b>*Talk</b> AAS 247, Phoenix	Jan 2026
<b>Talk</b> NHFP Symposium, Baltimore	Oct 2025
<b>Dissertation Talk</b> AAS 245, National Harbor	Jan 2025
<b>Talk</b> XIV Torino Workshop on AGB stars, Rome	Jun 2024

<b>Poster</b> Science with HST and JWST VII, Porto	Apr 2024
<b>Talk</b> AAS 243, New Orleans	Jan 2024
<b>Talk</b> AAS 241, Seattle	Jan 2023
<b>Talk</b> AAS 240, Pasadena	Jun 2022
<b>Poster</b> AAS 237 (Winner of Chambliss Award)	Jan 2021
<b>Talk</b> Gulf Coast Undergraduate Research Symposium, Houston	Nov 2017
<b>Talk</b> Emerging Researchers National Conference in STEM, D.C.	Mar 2017

\*Upcoming

## PUBLICATIONS

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### 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, [ApJ](#), 995, 135
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
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
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
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
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
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
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

### 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](#), 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](#)
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](#)

## RESEARCH ADVISING

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

2022 – 2023

## TEACHING EXPERIENCE

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

## OBSERVING EXPERIENCE

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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

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<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

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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 SERVICE

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Referee for ApJ, ApJL, A&A

Reviewer for international funding proposals

<b>Bay Area Scientists Inspiring Students (BASIS)</b>	2025 – Present
<b>AMP-UP Mentor for 2 PhD students</b>	2025 – Present
<b>Astrobites</b> , <a href="#">my articles</a> (Ombudsperson 23-25, Hiring Committee 23-24)	2022 – 2025
<b>Mentor to NASA FINESST applicants</b> , UChicago	2023 – 2025

Organized two workshops to help PhD students apply to the FINESST

<b>Inclusion, Diversity and Equity in Astronomy Club</b> , UChicago Organizer (2022 – 2024)	2019 – 2025
<b>Public Talk</b> Cosmology Talks Youtube, <i>Extragalactic distances from the JAGB method</i>	2024
<b>UChicago Empowerment of North Koreans</b> , English Tutor	2022 – 2023
<b>Advising &amp; Mentoring Program Organizer and Mentor</b> , UChicago Mentored three UChicago PhD students (2020 – 2025)	2020 – 2023
<b>Public Talk</b> Lake Forest College astronomy club, <i>The Expansion of the Universe</i>	2022
<b>AAS 242 Chambliss Judge</b>	2022
<b>Public Talk</b> UChicago <i>Physics of Stars</i> summer HS class, <i>Mentorship in Academia</i>	2021
<b>Space Explorers Winter Institute Instructor</b> , UChicago	2020
<b>Observing Nights Organizer</b> , Penn	2018 – 2019
<b>Astronomy Tutor for Veterans</b> , Penn Veterans Upward Bound	2018 – 2019

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## DEPARTMENT COMMITTEES AND RESPONSIBILITIES

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

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## OTHER ACTIVITIES

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