

# Abigail J. Lee

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## EDUCATION

<b>University of Chicago</b> Ph.D. Candidate, Astronomy & Astrophysics Advisor: Wendy Freedman	Chicago, IL Expected 2025
<b>University of Pennsylvania</b> B.A., Physics, <i>summa cum laude</i> Graduated with Departmental Honors Minors: Mathematics, Classical Studies Advisor: Gary Bernstein Thesis: <i>Reconstructing Lognormal Density Fields using Hamiltonian Monte Carlo Techniques</i>	Philadelphia, PA May 2019

## FELLOWSHIPS

<b>Future Investigators in NASA Earth and Space Science and Technology (FINESST)</b>	2022 – 2025
<b>Illinois Space Grant Consortium Graduate Fellowship</b>	2022 – 2023
<b>LSST Cooperation Data Science Fellowship</b>	2021 – 2023
<b>McCormick Graduate Fellowship</b> , University of Chicago <i>Awarded to highly-rated applicants to the Ph.D. program</i>	2019 – 2021

## SELECTED AWARDS & GRANTS

<b>Hubble Space Telescope (HST) Cycle 31 AR Program, Principal Investigator</b>	2023
<b>Hubble Space Telescope (HST) Cycle 30 AR Program, Principal Investigator</b>	2022
<b>Chambliss Astronomy Achievement Award</b> , 237th Meeting of the AAS <i>Awarded to the top graduate student posters at the AAS meeting</i>	2021
<b>Elaine K. Bernstein Women in Science Award</b> , University of Chicago <i>Awarded to highly-rated women applicants to the Ph.D. program</i>	2019
<b>NASA Pennsylvania Space Grant Undergraduate Scholarship</b>	2018
<b>University Scholar</b> , Penn	2015

## RESEARCH POSITIONS

<b>UChicago</b> , Graduate Research Assistant	2019 – Present
<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> , Summer Undergraduate Research Assistant	2017
<b>NASA Jet Propulsion Laboratory</b> , Summer Intern	2017
<b>Penn</b> , Experimental Condensed Matter Undergraduate Research Assistant	2016 – 2017

## TALKS

### INVITED SEMINARS & TALKS

<b>Seminar</b> SNU Physics & Astronomy, <i>Seoul, South Korea</i>	Sep 2023
<b>Talk</b> MIAPbP workshop on the extragalactic distance scale, <i>Munich, Germany</i>	Jul 2023
<b>Seminar</b> University of Pennsylvania Physics & Astronomy, <i>Philadelphia, PA</i>	Oct 2022
<b>Talk</b> Argonne National Lab Cosmology Group Meeting (virtual)	Oct 2021

### CONTRIBUTED TALKS

<b>*Talk</b> XIV Torino Workshop on AGB stars, <i>Rome, Italy</i>	Jun 2024
<b>*Poster</b> Science with the Hubble and James Webb Space Telescopes VII, <i>Porto, Portugal</i>	Apr 2024
<b>Talk</b> 243rd Meeting of the AAS, <i>New Orleans, LA</i>	Jan 2024
<b>Talk</b> UC Berkeley Stellar Populations group meeting, <i>Berkeley, CA</i>	Apr 2023
<b>Talk</b> 241st Meeting of the AAS, <i>Seattle, WA</i>	Jan 2023
<b>Talk</b> 240th Meeting of the AAS, <i>Pasadena, CA</i>	Jun 2022
<b>Talk</b> University of Chicago Astronomy Lunch Talks (virtual)	Jan 2022
<b>Poster</b> 237th Meeting of the AAS (virtual), Winner of Chambliss Astronomy Achievement Award	Jan 2021
<b>Talk</b> 2017 Gulf Coast Undergraduate Research Symposium, <i>Houston, TX</i>	Nov 2017
<b>Talk</b> 2017 Emerging Researchers National Conference in STEM, <i>Washington D.C.</i>	Mar 2017

\*Upcoming

## PUBLICATIONS

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### FIRST AND SINGLE AUTHOR PUBLICATIONS

1. **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, accepted to ApJ, [arXiv:2402.18794](#)
2. **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
3. **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
4. **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
5. **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
6. **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

### NTH AUTHOR PUBLICATIONS

1. Porth, L., Bernstein, G., Smith, R. E., **Lee, A. J.** *The Information Content of Projected Galaxy Fields*, 2022, [MNRAS](#), **518**, 3344
2. 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
3. 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
4. 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
5. 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

### UNREFEREED 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

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<b>Coral Espinoza</b> , Lake Forest College undergraduate	2022 – 2023
• Oversaw UChicago REU summer project and senior thesis. Coral analyzed 1 of the 11 galaxies presented in the following paper: Lee, A. J., et al. (includ. <b>Espinoza, C.</b> ), et al. (2024), accepted to ApJ	

## 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

## TELESCOPE & COMPUTING ALLOCATIONS

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<b>PI</b> : HST AR (PID: 17544), Cycle 31	2023
<b>PI</b> : HST AR (PID: 17052), Cycle 30	2022
<b>Co-I</b> : JWST GO (PID: 1995), Cycle 1	2021
<b>Co-I</b> : UChicago Midway Research II Computing Allocation, 123k hours	2021
<b>Co-I</b> : HST AR (PID: 16126), Cycle 28	2020
<b>Co-I</b> : HST AR (PID: 16127), Cycle 28	2020

## OBSERVING EXPERIENCE

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Public data – significant experience with data from JWST, HST, Gaia, 2MASS, VMC
Magellan-Baade FourStar Near-Infrared imaging - 17 nights
Magellan-Baade IMACS Optical imaging - 1 night

## PRESS

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<b>UChicago News</b> , <i><a href="#">Aging stars provide a new cosmological yardstick</a></i>	2021
<b>Penn Today</b> , <i><a href="#">Women in Physics Group inspires the next generation of physicists and astronomers</a></i>	2019

## PROFESSIONAL SERVICE

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<b>Science Referee</b> for ApJ	2022 – Present
<b>Climate Survey Committee Member</b> , UChicago	2021 – Present
<b>Inclusion, Diversity and Equity in Astronomy Club Organizer/Member</b> , UChicago	2019 – Present
<b>UChicago Empowerment/Emancipation of North Koreans (ENoK)</b> , English tutor	2022 – 2023
<b>Advising &amp; Mentoring Program Organizer and Mentor</b> , UChicago	2020 – 2023
<b>Faculty Meeting Graduate Student Representative</b> , UChicago	2019 – 2020
<b>Society of Physics Students Board Member</b> , Penn	2018 – 2019

## OUTREACH

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<b>Writer</b> , Astrobites (find my articles <a href="#">here</a> )	2022 – 2024
Ombudsperson, Hiring Committee	2023 – 2024
<b>Public Talks &amp; Lectures</b>	
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
<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

## AWARDED TRAVEL GRANTS

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<b>AAS International Travel Grant</b>	2024
<b>PhD Student Travel Stipend</b> , Munich Institute for Astro-, Particle and BioPhysics	2023
<i>Awarded to excellent advanced graduate students</i>	
<b>Travel Grant</b> , University of Chicago Grad Council	2021, 2022, 2023

## EXTRACURRICULARS & PERSONAL INFORMATION

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<b>Languages:</b> English (native), Spanish (intermediate), Korean (basic)	
<b>Professional Memberships:</b> AAS, KSEA (Korean-American Scientists and Engineers Association)	
<b>Soccer</b>	2019 – Present
<i>Play in several high-level (College Club/Division I-III experience) soccer leagues 3x per week</i>	
<b>University of Pennsylvania Womens's Club Soccer Team</b> , treasurer (2015 – 2017)	2015 – 2019
<b>University of Pennsylvania Symphony Orchestra</b> , first violin	2015 – 2019