

Abigail J. Lee

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EDUCATION

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

FELLOWSHIPS

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

SELECTED AWARDS & GRANTS

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| AGB Stars Prize for Young Researchers , XIV Torino Workshop on AGB Stars <i>Awarded to a young scientist providing a remarkable and most interesting contribution to AGB research</i> | 2024 |
| CCAPP Price Prize in Cosmology and AstroParticle Physics | 2024 |
| Hubble Space Telescope (HST) Cycle 31 AR Program, Principal Investigator | 2023 |
| Hubble Space Telescope (HST) Cycle 30 AR Program, Principal Investigator | 2022 |
| Chambliss Astronomy Achievement Award , 237th Meeting of the AAS <i>Awarded to the top graduate student posters at the AAS meeting</i> | 2021 |
| Elaine K. Bernstein Women in Science Award , University of Chicago <i>Awarded to highly-rated women applicants to the Ph.D. program</i> | 2019 |
| NASA Pennsylvania Space Grant Undergraduate Scholarship | 2018 |
| University Scholar , Penn | 2015 |

RESEARCH POSITIONS

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|---|----------------|
| UChicago , Graduate Research Assistant | 2019 – Present |
| 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 , Summer Undergraduate Research Assistant | 2017 |
| NASA Jet Propulsion Laboratory , Summer Intern | 2017 |
| Penn , Experimental Condensed Matter Undergraduate Research Assistant | 2016 – 2017 |

TALKS

INVITED SEMINARS & TALKS

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| *Price Prize Seminar The Ohio State University CCAPP, <i>Columbus, OH</i> | Aug 2024 |
| Seminar SNU Physics & Astronomy, <i>Seoul, South Korea</i> | Sep 2023 |
| Talk JHU Giant Branch Distance Scale Workshop, <i>Baltimore, MD</i> | Nov 2023 |
| Talk MIAPbP workshop on the extragalactic distance scale, <i>Munich, Germany</i> | Jul 2023 |
| Seminar University of Pennsylvania Physics & Astronomy, <i>Philadelphia, PA</i> | Oct 2022 |

CONTRIBUTED TALKS

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

*Upcoming

PUBLICATIONS

FIRST AND SINGLE AUTHOR PUBLICATIONS

1. **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*, 2024c, submitted to ApJ
2. **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](#)
3. **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](#)
4. **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](#)
5. **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](#)
6. **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](#)
7. **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. 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): Three Independent Astrophysical Determinations of the Hubble Constant Using the James Webb Space Telescope*, 2024, submitted to ApJ
2. 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*, 2024, submitted to ApJ
3. 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, submitted to ApJ, [arXiv:2407.07309](#)

4. Porth, L., Bernstein, G., Smith, R. E., **Lee, A. J.** *The Information Content of Projected Galaxy Fields*, 2022, [MNRAS](#), **518**, 3344
5. 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
6. 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
7. 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
8. 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

Coral Espinoza, Lake Forest College (LFC) undergraduate 2022 – 2023
Oversaw UChicago REU summer project and LFC senior thesis, winner of AAS 242 FAMOUS grant

TEACHING EXPERIENCE

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| 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 |

TELESCOPE & COMPUTING ALLOCATIONS

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| PI | |
| Magellan-Baade/FourStar, 3 nights, Cycle 2024B | 2024 |
| HST AR (PID: 17544), Cycle 31 | 2023 |
| HST AR (PID: 17052), Cycle 30 | 2022 |
| Co-I | |
| JWST GO (PID: 1995, PIs: W. Freedman, B. Madore), Cycle 1 | 2021 |
| UChicago Midway Research II Computing Allocation (PI: J. Frieman), 123k hours | 2021 |
| HST AR (PID: 16126, PI: W. Freedman), Cycle 28 | 2020 |
| HST AR (PID: 16127, PI: W. Freedman), Cycle 28 | 2020 |

OBSERVING EXPERIENCE

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

PROFESSIONAL SERVICE

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| Science Referee for ApJ | 2022 – Present |
| Climate Survey Committee Member, UChicago | 2021 – Present |
| Inclusion, Diversity and Equity in Astronomy Club Organizer/Member, UChicago | 2019 – Present |
| AAS 242 Chambliss Judge | Jun 2022 |
| UChicago Empowerment/Emancipation of North Koreans (ENoK), English tutor | 2022 – 2023 |
| Advising & Mentoring Program Organizer and Mentor, UChicago | 2020 – 2023 |
| Mentored two UChicago PhD students | 2020 – Present |
| Faculty Meeting Graduate Student Representative, UChicago | 2019 – 2020 |
| Society of Physics Students Board Member, Penn | 2018 – 2019 |

OUTREACH

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| Writer, Astrobites (find my articles here) | 2022 – 2024 |
| Ombudsperson, Hiring Committee | 2023 – 2024 |
| Public Talks & Lectures | |
| UChicago astronomy grad student lunch talks, <i>Tips on Winning a FINESST grant</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 |

AWARDED TRAVEL GRANTS

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

EXTRACURRICULARS & PERSONAL INFORMATION

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| Languages: English (native), Spanish (intermediate), Korean (basic) | |
| Soccer, play in several high-level (College Club/Division I-III experience) leagues 3x per week | 2019 – Present |
| University of Pennsylvania Womens's Club Soccer Team, treasurer (2015 – 2017) | 2015 – 2019 |
| University of Pennsylvania Symphony Orchestra, first violin | 2015 – 2019 |