

Abigail J. Lee

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EDUCATION

University of Chicago Chicago, IL
Ph.D. Candidate, Astronomy & Astrophysics Expected 2025
Advisor: Wendy Freedman

University of Pennsylvania Philadelphia, PA
B.A., Physics, *summa cum laude* May 2019
Graduated with Departmental Honors
Minors: Mathematics, Classical Studies
Advisor: Gary Bernstein

FELLOWSHIPS

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

SELECTED AWARDS & GRANTS

Hubble Space Telescope (HST) Cycle 31 AR Program, Principal Investigator 2023
Graduate Student Travel Stipend, Munich Institute for Astro-, Particle and BioPhysics 2023
Travel Grant, University of Chicago Grad Council 2021, 2022, 2023
Hubble Space Telescope (HST) Cycle 30 AR Program, Principal Investigator 2022
Chambliss Astronomy Achievement Award, 237th Meeting of the AAS 2021
Elaine K. Bernstein Women in Science Award, University of Chicago 2019
Awarded to highly-rated women applicants to the Ph.D. program
NASA Pennsylvania Space Grant Undergraduate Scholarship 2018
University Scholar, Penn 2015

RESEARCH POSITIONS

Seoul National University, Summer Visiting Researcher 2023
UChicago, Graduate Research Assistant 2019 – Present
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

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

CONTRIBUTED TALKS

*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.**, 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*, 2023, submitted to ApJ
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*, 2023, submitted to ApJ
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

- Coral Espinoza**, Lake Forest College undergraduate 2022 – 2023
- Oversaw UChicago REU summer project and senior thesis. Coral was awarded the AAS FAMOUS grant to present her work at AAS 242. Coral also analyzed 1 of the 11 galaxies presented in the following paper:
Lee, A. J., et al. (includ. **Espinoza, C.**), et al. (2023), submitted.

TEACHING EXPERIENCE

- 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

TELESCOPE & COMPUTING ALLOCATIONS

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

OBSERVING EXPERIENCE

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

PRESS

- UChicago News**, *[Aging stars provide a new cosmological yardstick](#)* 2021
Penn Today, *[Women in Physics Group inspires the next generation of physicists and astronomers](#)* 2019

PROFESSIONAL SERVICE

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

OUTREACH

- Writer**, Astrobites (find my articles [here](#)) 2022 – Present
Ombudsperson, Hiring Committee 2023 – 2024
Public Talks & Lectures
Lake Forest College astronomy club, *The Expansion of the Universe* 2022
UChicago *Physics of Stars* summer HS class, *Mentorship in Academia* 2021
Space Explorers Winter Institute Instructor, UChicago 2020
Observing Nights Organizer, Penn 2018 – 2019

WORKSHOPS & SUMMER SCHOOLS

Improving JWST Data Products Workshop <i>Space Telescope Science Institute</i>	2023
The Extragalactic Distance Scale and Cosmic Expansion in the era of JWST <i>Munich Institute for Astro, Particle, and BioPhysics – awarded graduate student travel stipend (\$550)</i>	2023
Fundamental cosmology from the ELT and space <i>4th Azores School on Observational Cosmology (attended virtually due to COVID-19)</i>	2021
Gaia Early DR3 Early Science and Best Practices <i>Virtual</i>	2021

EXTRACURRICULARS & PERSONAL INFORMATION

Languages: English (native), Spanish (intermediate), Korean (basic)	
Professional Memberships: AAS, KSEA (Korean-American Scientists and Engineers Association)	
University of Pennsylvania Womens's Club Soccer Team , treasurer (2015 – 2017)	2015 – 2019
University of Pennsylvania Symphony Orchestra , first violin	2015 – 2019