

Abigail J. Lee

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EDUCATION

University of Chicago

Ph.D. Candidate, Astronomy & Astrophysics

Advisor: Wendy Freedman

Chicago, IL

Expected 2025

University of Pennsylvania

B.A., Physics (with Departmental Honors), summa cum laude

Minors in Mathematics and Classical Studies

Senior Thesis: Reconstructing Lognormal Density Fields using Hamiltonian Monte Carlo Techniques

Advisor: Gary Bernstein

Philadelphia, PA

May 2019

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

Talk UC Berkeley Stellar Populations group meeting, *Berkeley, CA* Apr 2023

Seminar University of Pennsylvania Physics & Astronomy, *Philadelphia, PA* Oct 2022

Talk University of Chicago Astronomy Lunch Talks (virtual) Jan 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 241st Meeting of the AAS, <i>Seattle, WA</i>	Jan 2023
Talk 240th Meeting of the AAS, <i>Pasadena, CA</i>	Jun 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

PUBLICATIONS

FIRST AND SINGLE AUTHOR PUBLICATIONS

1. **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
2. **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](#)
3. **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](#)
4. **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](#)
5. **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 2022 – 2023
- Oversaw UChicago REU summer project and senior thesis. Coral was awarded the AAS FAMOUS grant to present her work at AAS 242.

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

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 - 16 nights
Magellan-Baade IMACS Optical imaging - 1 night

PRESS

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

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	2023 – 2024
Public Talks & Lectures	
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

WORKSHOPS & SUMMER SCHOOLS

The Extragalactic Distance Scale and Cosmic Expansion in the era of JWST	2023
<i>Munich Institute for Astro, Particle, and BioPhysics – awarded graduate student travel stipend (\$550)</i>	

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