

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, *summa cum laude*
Graduated with Departmental Honors
Minors: Classical Studies, Mathematics
Advisor: Gary Bernstein

Philadelphia, PA
May 2019

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

FELLOWSHIPS

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	2019 – 2021
<i>Awarded to highly-rated applicants to the Ph.D. program</i>	

SELECTED AWARDS & GRANTS

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	2021
<i>Awarded to the top graduate student posters at the AAS meeting</i>	
Elaine K. Bernstein Women in Science Award , University of Chicago	2019
<i>Awarded to highly-rated women applicants to the Ph.D. program</i>	
NASA Pennsylvania Space Grant Undergraduate Scholarship	2018
University Scholar , Penn	2015

RESEARCH POSITIONS

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

Seminar SNU Physics & Astronomy, <i>Seoul, South Korea</i>	Sep 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
Talk Argonne National Lab Cosmology Group Meeting (virtual)	Oct 2021

CONTRIBUTED TALKS

*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.**, 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
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

Coral Espinoza , 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. Espinoza, C.), et al. (2024), accepted to ApJ	

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
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

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 Organizer/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 – 2024
Ombudsperson, Hiring Committee	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

AWARDED TRAVEL GRANTS

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

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