

# Abigail J. Lee

Email: [abbyl@uchicago.edu](mailto:abbyl@uchicago.edu) • Website: [abiglee7.github.io](https://abiglee7.github.io)

## EDUCATION

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### University of Chicago

*Ph.D. Candidate, Astronomy & Astrophysics*

Advisor: Wendy Freedman

Currently pursuing the *College Teaching Certificate*

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

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**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

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**Hubble Space Telescope (HST) Cycle 31 AR Program, Principal Investigator** 2023

**Graduate Student Travel Stipend**, Munich Institute for Astro-, Particle and BioPhysics 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

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**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

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### INVITED SEMINARS & TALKS

**Talk** MIAPbP workshop on the extragalactic distance scale Jul 2023

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

**Seminar** University of Pennsylvania Physics & Astronomy 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 241st Meeting of the AAS	Jan 2023
Talk 240th Meeting of the AAS	Jun 2022
Poster 237th Meeting of the AAS (virtual), Winner of Chambliss Astronomy Achievement Award	Jan 2021
Talk 2017 Gulf Coast Undergraduate Research Symposium	Nov 2017
Talk 2017 Emerging Researchers National Conference in STEM	Mar 2017

## PUBLICATIONS

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### FIRST AND SINGLE AUTHOR PUBLICATIONS

1. **Lee, A. J.** *An Empirical Test for the Metallicity, Age, and Reddening Sensitivity of the J-region Asymptotic Giant Branch (JAGB) Method*, 2023, in press at ApJ, [arXiv:2305.02453](#)
2. **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
3. **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
4. **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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**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

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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> : 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  
Magellan-Baade FourStar Near-Infrared imaging - 16 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>UChicago Empowerment/Emancipation of North Koreans (ENoK)</b> , English tutor	2022 – 2023
<b>Climate Survey Committee Member</b> , UChicago	2021 – 2023
<b>Advising &amp; Mentoring Program Organizer</b> , UChicago	2020 – 2023
<b>Inclusion, Diversity and Equity in Astronomy Club Member</b> , UChicago	2019 – Present
<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 – Present
<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

## WORKSHOPS & SUMMER SCHOOLS

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<b>The Extragalactic Distance Scale and Cosmic Expansion in the era of JWST</b>	2023
<i>Munich Institute for Astro, Particle, and BioPhysics – awarded graduate student travel stipend (\$550)</i>	
<b>Fundamental cosmology from the ELT and space</b>	2021
<i>4th Azores School on Observational Cosmology (attended virtually due to COVID-19)</i>	

EXTRACURRICULARS & PERSONAL INFORMATION

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**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