

# 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

2019 – Present

### University of Pennsylvania

*B.A., Physics & Astronomy (with 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

## AWARDS & FELLOWSHIPS

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<b>Future Investigators in NASA Earth and Space Science and Technology (FINESST)</b>	2022 – 2025
<b>Hubble Space Telescope (HST) Cycle 30 AR Program, Principal Investigator</b>	2022
<b>Illinois Space Grant Consortium Graduate Fellowship</b>	2022
<b>LSST Cooperation Data Science Fellowship</b>	2021 – 2023
<b>Most Engaging Presentation Award, UChicago Three Minute Thesis Competition</b>	2021
<b>Chambliss Astronomy Achievement Award, 237th Meeting of the AAS</b>	2021
<b>Elaine K. Bernstein Women in Science Award, University of Chicago</b>	2019
<b>McCormick Graduate Fellowship, University of Chicago</b>	2019 – 2021
<b>NASA Pennsylvania Space Grant Undergraduate Scholarship</b>	2018

## RESEARCH POSITIONS

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<b>UChicago</b> , Graduate Research Assistant	2019 – Present
<b>Penn</b> , Cosmology Undergraduate Research Assistant	2017 – 2019
<b>Stanford KIPAC</b> , Summer Undergraduate Research Assistant	2018
<b>Max Planck Institute for Gravitational Physics</b> , Summer Undergraduate Research Assistant	2017
<b>NASA Jet Propulsion Laboratory</b> , Summer Intern	2017
<b>Penn</b> , Experimental Condensed Matter Undergraduate Research Assistant	2016 – 2017

## TALKS

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### INVITED TALKS

<b>Colloquium</b> University of Pennsylvania	Oct 2022
<b>Talk</b> University of Chicago Astronomy Lunch Seminar	Jan 2022
<b>Talk</b> Argonne National Lab Cosmology Group Meeting	Oct 2021

### CONTRIBUTED TALKS

<b>Talk</b> 240th Meeting of the AAS	Jun 2022
<b>Poster</b> 237th Meeting of the AAS, Winner of Chambliss Astronomy Achievement Award	Jan 2021
<b>Talk</b> 2017 Gulf Coast Undergraduate Research Symposium	Nov 2017
<b>Talk</b> 2017 Emerging Researchers National Conference in STEM	Mar 2017

## PUBLICATIONS

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### FIRST AUTHOR PUBLICATIONS

1. **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, accepted to ApJ, [arXiv:2205.11323](https://arxiv.org/abs/2205.11323)

2. **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
3. **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. 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, submitted to [ApJ](#)
2. Porth, L., Bernstein, G., Smith, R. E., **Lee, A. J.** *The Information Content of Projected Galaxy Fields*, 2021, submitted to MNRAS. [arXiv:2111.13702](#)
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

## TEACHING EXPERIENCE

<b>Primary science mentor</b> for Coral Espinoza (Lake Forest College)	2022 – Present
• Project: Measuring the Distance to NGC 6822 using Observations from the Magellan Telescope	
<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

## SUCCESSFUL PROPOSALS & GRANTS

### NATIONAL GRANTS

<b>FI: Future Investigators in NASA Earth and Space Science and Technology (FINESST)</b> , \$150k	2022
<i>Measuring the Hubble constant with Carbon Stars</i>	
PI: <b>HST</b> Cycle 30 AR	2022
<i>Quantifying Systematics in the JAGB Method Distance Scale in M31</i>	
Co-I: <b>JWST</b> Cycle 1 GO (PI: Wendy Freedman & Barry Madore)	2021
<i>Answering the Most Important Problem in Cosmology Today: Is the Tension in the Hubble Constant Real?</i>	
Co-I: <b>HST</b> Cycle 28 AR (PI: Wendy Freedman)	2020
<i>An Independent Appraisal of the Cepheid Distance Scale</i>	
Co-I: <b>HST</b> Cycle 28 AR (PI: Wendy Freedman)	2020
<i>Absolute Magnitude Calibration of SNe Ia at 1%: Doubling the Sample of TRGB Host-Galaxy SN Calibrators</i>	

### UNIVERSITY GRANTS

Co-I: <b>Midway</b> Research II Allocation (PI: Josh Frieman), 123k hours	2021
<i>Constraining dark energy's equation of state parameter <math>w</math> from strong lensing</i>	
PI: <b>UChicago Grad Council</b> Travel Grants, \$1k	2021, 2022
PI: <b>Penn University Scholars</b> Fund, \$14k	2016, 2018

## OBSERVING EXPERIENCE

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Public data – significant experience with data from HST, Gaia, 2MASS  
Magellan-Baade FourStar Near-Infrared imaging - 11 nights  
Magellan-Baade IMACS Optical imaging - 1 night

## PRESS

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**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

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**Science Referee** for The Astrophysical Journal (ApJ) – 1 paper total 2022 – Present  
**Climate Survey Committee Member**, UChicago 2021 – Present  
**Advising & Mentoring Program Organizer**, UChicago 2020 – Present  
**Inclusion, Diversity and Equity in Astronomy Club Member**, UChicago 2019 – Present  
**Alumni Interviewer**, Penn 2019 – 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 – Present  
**Guest Lecturer on “Mentorship in Academia”**, UChicago Physics of Stars class 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

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**Fundamental cosmology from the ELT and space** 2021  
*4th Azores School on Observational Cosmology (attended virtually due to COVID-19)*  
**Gaia Early DR3 Early Science and Best Practices** 2021  
*Virtual*

## OTHER ACTIVITIES

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**Chicago Fire Rec Soccer League** 2019 – Present  
**Author of *The Bachelor* arXiv april fools paper**, [link here](#) 2022  
**University of Pennsylvania Womens’s Club Soccer Team**, treasurer (2015 – 2017) 2015 – 2019  
**University of Pennsylvania Symphony Orchestra**, first violin 2015 – 2019