

# Abigail J. Lee

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## EDUCATION

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<b>University of Chicago</b> <i>Ph.D. Candidate, Astronomy &amp; Astrophysics</i> Advisor: Wendy Freedman	Chicago, IL <i>Expected 2025</i>
<b>University of Pennsylvania</b> <i>B.A., Physics (with Honors); Minors in Mathematics and Classical Studies, summa cum laude</i> Senior Thesis: Reconstructing Lognormal Density Fields using Hamiltonian Monte Carlo Techniques Advisor: Gary Bernstein	Philadelphia, PA <i>May 2019</i>

## FELLOWSHIPS

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<b>LSST Coorporation Data Science Fellowship</b> <i>LSST Corporation</i>	2021 – 2023
<b>McCormick Graduate Fellowship</b> <i>University of Chicago</i>	2019 – 2021
<b>University Scholars Research Grant</b> <i>University of Pennsylvania</i>	2016, 2017

## AWARDS

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<b>Most Engaging Presentation Award</b> <i>University of Chicago Three Minute Thesis Competition</i>	2021
<b>Chambliss Astronomy Achievement Award</b> <i>237th Meeting of the American Astronomical Society</i>	2021
<b>Elaine K. Bernstein Women in Science Award</b> <i>University of Chicago</i>	2019
<b>NASA Pennsylvania Space Grant Undergraduate Scholarship</b> <i>NASA</i>	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

## PUBLICATIONS

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### First-author

1. 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
2. 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

### Co-author

1. Porth, L., Bernstein, G., Smith, R. E., Lee, A. J. *The Information Content of Projected Galaxy Fields*, 2021, submitted to MNRAS. [arXiv:2111.13702](https://arxiv.org/abs/2111.13702)

2. Owens, K. A., Freedman, W. L., Madore, B. F., **Lee, A. J.** *Current Challenges in Cepheid Distance Calibrations Using Gaia EDR3*, 2022, accepted to ApJ. [arXiv:2201:00733](#)
3. Freedman, W. L., Madore, B. F., **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*. 2021, accepted to ApJ. [arXiv:2112:06968](#)
4. 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](#)

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## SUCCESSFUL PROPOSALS & GRANTS

### National Grants

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

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## TEACHING EXPERIENCE

<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

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## OBSERVING EXPERIENCE

Public data – significant experience with data from HST, Gaia, 2MASS	
Magellan-Baade Fourstar - 5 nights (virtual due to COVID-19)	2021

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## PRESS

<b>UChicago News</b> , <a href="#">Aging stars provide a new cosmological yardstick</a>	2021
<b>Penn Today</b> , <a href="#">Women in Physics Group inspires the next generation of physicists and astronomers</a>	2019

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## TALKS

### Invited Seminar Talks

<b>Carbon Stars as Standard Candles: Establishing the Foundations for a Measurement of <math>H_0</math></b>	2022
<i>UChicago Astronomy Lunch Seminar</i>	
<b>The JAGB Method: Using Carbon Stars as Standard Candles</b>	2021
<i>Argonne National Lab Cosmology Group Meeting</i>	

### Conference Talks

<b>The JAGB Method: Using Carbon Stars as Standard Candles</b> <i>239th Meeting of the American Astronomical Society (*Accepted abstract; meeting canceled due to COVID-19)</i>	2022
<b>Distance to WLM Using Observations of the TRGB, Cepheids, and JAGB Stars</b> <i>237th Meeting of the American Astronomical Society</i>	2021
<b>Characterizing the temporal variability of backscatter in prep. for the NISAR mission</b> <i>2017 AGU Fall Meeting</i>	2017
<b>Characterizing Backscatter Variability using UAVSAR</b> <i>2017 Gulf Coast Undergraduate Research Symposium</i>	2017
<b>Improved Performance in Graphene &amp; MoS<sub>2</sub> FETs using a BN Isolation Layer</b> <i>2017 Emerging Researchers National Conference in STEM</i>	2017

## PROFESSIONAL SERVICE

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<b>Climate Survey Committee Member, UChicago</b>	2021 – Present
<b>Graduate Student Peer Mentorship Program Organizer, UChicago</b>	2019 – Present
<b>Advising &amp; Mentoring Working Group Member, UChicago</b>	2020 – Present
<b>Inclusion, Diversity and Equity in Astronomy Club Member, UChicago</b>	2019 – Present
<b>Alumni Interviewer, Penn</b>	2019 – 2020
<b>Faculty Meeting Graduate Student Representative, UChicago</b>	2019 – 2020
<b>Society of Physics Students Board Member, Penn</b>	2018 – 2019

## OUTREACH

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<b>Writer, Astrobites</b>	2022 – Present
<b>Guest Lecturer on “Mentorship in Academia”, UChicago Physics of Stars class</b>	2021
<b>Space Explorers Winter Institute Instructor, UChicago</b>	2020
<b>Observing Nights Organizer, Penn</b>	2018 – 2019
<b>Astronomy Tutor for Veterans, Penn Veterans Upward Bound</b>	2018 – 2019

## WORKSHOPS & SUMMER SCHOOLS

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