

# 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 (with Honors); Minors in Mathematics and Classical Studies, summa cum laude*

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

Advisor: Gary Bernstein

Philadelphia, PA

May 2019

## AWARDS & FELLOWSHIPS

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**Illinois Space Grant Consortium Graduate Research Fellowship**

2022

**LSST Corporation Data Science Fellowship**

2021 – 2023

**Most Engaging Presentation Award**, UChicago Three Minute Thesis Competition

2021

**Chambliss Astronomy Achievement Award**, 237th Meeting of the American Astronomical Society

2021

**Elaine K. Bernstein Women in Science Award**, University of Chicago

2019

**McCormick Graduate Fellowship**, University of Chicago

2019 – 2021

**NASA Pennsylvania Space Grant Undergraduate Scholarship**

2018

## RESEARCH POSITIONS

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**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

## PUBLICATIONS

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### First-author

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, submitted to ApJ
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

### 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](#)
2. 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
3. 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

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

## SUCCESSFUL PROPOSALS & GRANTS

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### National Grants

- Co-I: **JWST** Cycle 1 GO (PI: Wendy Freedman & Barry Madore) 2021  
*Answering the Most Important Problem in Cosmology Today: Is the Tension in the Hubble Constant Real?*  
 Co-I: **HST** Cycle 28 AR (PI: Wendy Freedman) 2020  
*An Independent Appraisal of the Cepheid Distance Scale*  
 Co-I: **HST** Cycle 28 AR (PI: Wendy Freedman) 2020  
*Absolute Magnitude Calibration of SNe Ia at 1%: Doubling the Sample of TRGB Host-Galaxy SN Calibrators*

### University Grants

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

## TEACHING EXPERIENCE

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- Guest Lecturer**, UChicago, *Galaxies* 2020  
**Teaching Assistant**, UChicago, *Galaxies* 2020  
**Teaching Assistant**, UChicago, *Stars* 2019  
**Teaching Assistant**, Penn, *Classical Mechanics* 2019  
**Observing Labs Teaching Assistant**, Penn, *Survey of the Universe* 2018, 2019  
**Teaching Assistant**, Penn, *E&M, Optics, and Modern Physics* 2018  
**Lab Teaching Assistant**, Penn, *Classical Mechanics* 2017  
**Tutor**, Penn Physics Department 2016, 2017

## OBSERVING EXPERIENCE

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- Public data – significant experience with data from HST, Gaia, 2MASS  
 Magellan-Baade Fourstar - 7 nights (virtual due to COVID-19) 2021 – 2022

## 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

## TALKS

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### Invited Seminar Talks

- Carbon Stars as Standard Candles: Establishing the Foundations for a Measurement of  $H_0$**  2022  
*UChicago Astronomy Lunch Seminar*  
**The JAGB Method: Using Carbon Stars as Standard Candles** 2021  
*Argonne National Lab Cosmology Group Meeting*

### Conference Talks

- The JAGB Method: Using Carbon Stars as Standard Candles** 2022  
*239th Meeting of the American Astronomical Society (\*Accepted abstract; meeting canceled due to COVID-19)*  
**Distance to WLM Using Observations of the TRGB, Cepheids, and JAGB Stars** 2021  
*237th Meeting of the American Astronomical Society*  
**Characterizing the temporal variability of backscatter in prep. for the NISAR mission** 2017  
*2017 AGU Fall Meeting*

<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</b> , UChicago	2021 – Present
<b>Graduate Student Peer Mentorship Program Organizer</b> , UChicago	2019 – Present
<b>Advising &amp; Mentoring Working Group Member</b> , UChicago	2020 – Present
<b>Inclusion, Diversity and Equity in Astronomy Club Member</b> , UChicago	2019 – Present
<b>Alumni Interviewer</b> , Penn	2019 – 2020
<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>Guest Lecturer on “Mentorship in Academia”</b> , UChicago Physics of Stars class	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>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