

Abigail J. Lee

Email: abbyl@uchicago.edu • Website: abiglee7.github.io

EDUCATION

University of Chicago <i>Ph.D. Candidate, Astronomy & Astrophysics</i> Advisor: Wendy Freedman	Chicago, IL <i>Expected 2025</i>
University of Pennsylvania <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

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

AWARDS

Most Engaging Presentation Award <i>University of Chicago Three Minute Thesis Competition</i>	2021
Chambliss Astronomy Achievement Award <i>237th Meeting of the American Astronomical Society</i>	2021
Elaine K. Bernstein Women in Science Award <i>University of Chicago</i>	2019
NASA Pennsylvania Space Grant Undergraduate Scholarship <i>NASA</i>	2018

RESEARCH POSITIONS

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

First-author

- 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
- 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
- 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, 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](#)

SUCCESSFUL PROPOSALS & GRANTS

National Grants

Co-I: JWST 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: HST Cycle 28 AR (PI: Wendy Freedman)	2020
<i>An Independent Appraisal of the Cepheid Distance Scale</i>	
Co-I: HST 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: Midway Research II Allocation (PI: Josh Frieman), 123k hours	2021
<i>Constraining dark energy's equation of state parameter w from strong lensing</i>	
PI: UChicago Grad Council Travel Grants, \$1k	2021, 2022
PI: Penn University Scholars Fund, \$14k	2016, 2018

TEACHING EXPERIENCE

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

OBSERVING EXPERIENCE

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

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

TALKS

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
- Characterizing Backscatter Variability using UAVSAR** 2017
2017 Gulf Coast Undergraduate Research Symposium
- Improved Performance in Graphene & MoS₂ FETs using a BN Isolation Layer** 2017
2017 Emerging Researchers National Conference in STEM

PROFESSIONAL SERVICE

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

OUTREACH

- Writer, Astrobites** 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

- 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