

Abigail J. Lee

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EDUCATION

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

Future Investigators in NASA Earth and Space Science and Technology (FINESST)	2022 – 2025
Hubble Space Telescope (HST) Cycle 30 AR Program, Principal Investigator	2022
Illinois Space Grant Consortium Graduate Fellowship	2022
LSST Cooperation Data Science Fellowship	2021 – 2023
Most Engaging Presentation Award, UChicago Three Minute Thesis Competition	2021
Chambliss Astronomy Achievement Award, 237th Meeting of the AAS	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

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

INVITED TALKS

Seminar University of Pennsylvania	Oct 2022
Talk University of Chicago Astronomy Lunch Seminar	Jan 2022
Talk Argonne National Lab Cosmology Group Meeting	Oct 2021

CONTRIBUTED TALKS

Talk 240th Meeting of the AAS	Jun 2022
Poster 237th Meeting of the AAS, 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

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, [ApJ](#), **933**, 201

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

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

SUCCESSFUL PROPOSALS & GRANTS

NATIONAL GRANTS

FI: Future Investigators in NASA Earth and Space Science and Technology (FINESST) , \$150k	2022
<i>Measuring the Hubble constant with Carbon Stars</i>	
PI: HST Cycle 30 AR	2022
<i>Quantifying Systematics in the JAGB Method Distance Scale in M31</i>	
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

OBSERVING EXPERIENCE

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

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

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

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

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

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