

Jaemyoung (Jason) Lee

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Research Interests

SN Ia Cosmology: Wavelength-dependent atmospheric effects, astrometric/photometric redshifts, host-galaxy environmental effects

- Part of the Dark Energy Survey Supernova Working Group (DES-SNWG)

- Part of the Vera C. Rubin Observatory Legacy Survey of Space and Time - Dark Energy Science Collaboration Time Domain Working Group (LSST-DESC-TDWG)

Large Scale Structure: Baryon Acoustic Oscillations (BAO), Modified Gravity, Cosmic Infrared Background (CIB), weak gravitational lensing, higher-order statistics, time-evolving dark energy

Employment

Research Associate

Advisor: Keith Bechtol

University of Wisconsin Madison

Sept. 2025 -

Postdoctoral Researcher

Advisor: Masao Sako

University of Pennsylvania

May 2025 - Aug. 2025

Military Service as an English Interpreter

Discharged as a sergeant on March 1st, 2016

Army Signal School, South Korea

June 2014 - Mar. 2016

Education

Ph.D. in Physics and Astronomy

Advisors: Masao Sako & Ravi Sheth, M.S. in August 2022

University of Pennsylvania

Sept. 2020 - May 2025

B.S. in Physics and B.A. in English Language and Literature

Dual major

Korea University

Mar. 2013 - Feb. 2020

Study Abroad

Engaged in undergraduate research with J. Richard Bond's group, resulted in a first-author publication

University of Toronto

Sept. 2018 - Apr. 2019

Awards and Honors

Star Reviewer Prize

Machine Learning and the Physical Sciences Workshop at NeurIPS

December 2025

San Diego, California

- For thoughtful, on-time, & constructive reviews for a large number of papers.

Rodger Doxsey Travel Prize Honorary Winner

American Astronomical Society

December 2024

National Harbor, Maryland

- For participation in the 245th AAS meeting

Dissertation Completion Fellowship

Department of Physics and Astronomy (University of Pennsylvania)

July 2024 - Apr. 2025

Philadelphia, Pennsylvania

- School of Arts and Sciences fellowship awarded based on academic excellence and feasibility of completion - <https://pan-school.sas.upenn.edu/graduate-division/current-students/funding/dissertation-support-graduate-division>

Mitacs Globalink Research Award
Canadian Institute for Theoretical Astrophysics

May 2019 - Aug. 2019
Toronto, Ontario, Canada

- Funding for summer research

National Excellence Scholarship for Science and Technology Majors *Mar. 2017 - Feb. 2019*
Department of Physics (Korea University) *Seoul, South Korea*

- Full funding for university tuition (4 semesters) by the Korea Student Aid Foundation

Services

Referee for various journals/conferences *Sept. 2024 - present*
ApJ, PRD, PRL, ML4PS Workshop at NeurIPS, Physics of the Dark Universe

LSST-DESC Membership Committee (Co-Chair) *Mar. 2026 - present*

LSST-DESC language editor-reviewer *Sept. 2025 - present*

LSST-DESC paper review committee *Oct. 2025 - present*
- Point of Contact for the Time-Domain working group

LSST-DESC Collaboration Council Nomination Committee (Chair) *Sept. 2025 - Dec. 2025*
- In charge of running elections and confirming new members of the Collaboration Council (20 members that represent DESC)

Judge for the Chambliss Student Poster Competition at AAS 245 *Jan. 2025*

Publications

Lead / Co-lead author publications

- [1] **Lee J.**, Camilleri, R., Davis, T., and the DES Collaboration (2026)
 The SN-Unite Program: A joint measurement of the Hubble constant and the sound horizon
in preparation
- [2] **Lee J.**, Camilleri, R., Sako M., Davis T., Bechtol K., and the DES Collaboration (2026)
 The SN-Unite Program: Host Galaxy Mass Measurements of Type Ia Supernovae and Its Impact on Cosmology
in preparation
- [3] Camilleri, R., **Lee J.**, Davis, T., and the DES Collaboration (2026)
 The SN-Unite Program: Combining Pantheon+ and DES-SN5YR
in preparation
- [4] **Lee J.**, Fiorini, B., Nikakhtar, F., and Sheth, R.K. (2024)
[The Stability of the BAO Linear Point under Modified Gravity](#)
arXiv: 2406.09379, submitted to Physical Review D

- [5] **Lee J.**, Sako, M., Kessler, R., Malz, A.I., and the LSST DESC Collaboration (2024)
[Astrometric Redshifts of Supernovae](#)
The Astrophysical Journal, 977, 199
- [6] **Lee J.**, Nikakhtar, F., Paranjape A., and Sheth, R.K. (2024)
[Eigen-decomposition of Covariance matrices: An application to the BAO Linear Point](#)
Physical Review D, 110, 103515
- [7] **Lee J.**, Bond J.R., Motloch P., van Engelen A. and Stein G. (2024)
[Exploring the Non-Gaussianity of the Cosmic Infrared Background and Its Weak Gravitational Lensing](#)
Monthly Notices of the Royal Astronomical Society, 529, 2543
- [8] **Lee J.** and Acevedo M., Sako M., Vincenzi M., Brout D., Sanchez B., et al. (2023)
[The Dark Energy Survey Supernova Program: Corrections on photometry due to wavelength-dependent atmospheric effects](#)
The Astronomical Journal, 165, 222

Publications with major contributions

- [1] Doux C., Jain B., Zeurcher D., **Lee J.**, Fang, X., Rosenfeld, R., et al. (2022)
[Dark energy survey year 3 results: cosmological constraints from the analysis of cosmic shear in harmonic space](#)
Monthly Notices of the Royal Astronomical Society, 515, 1942

Publications as part of the DES-SNWG (major contributions)

- [1] Vincenzi M., Kessler R., Shah P., **Lee J.**, Davis, T.M., Scolnic D., et al. (2025)
[Comparing the DES-SN5YR and Pantheon+ SN cosmology analyses: Investigation based on “Evolving Dark Energy or Supernovae systematics?”](#)
Monthly Notices of the Royal Astronomical Society, 541, 2585
- [2] Sánchez B.O., Brout D., Vincenzi M., et al. (2024)
[The Dark Energy Survey Supernova Program: Light curves and 5-Year data release](#)
The Astrophysical Journal, 975, 5
- [3] Vincenzi M., Brout D., et al. (2024)
[The Dark Energy Survey Supernova Program: Cosmological Analysis and Systematic Uncertainties](#)
The Astrophysical Journal, 975, 86
- [4] DES Collaboration: Abbott T.M.C., Acevedo, M., et al. (2024)
[The Dark Energy Survey: Cosmology Results With 1500 New High-redshift Type Ia Supernovae Using The Full 5-year Dataset](#)
The Astrophysical Journal Letters, 973, L14

Publications as part of the DES-SNWG (minor contributions)

- [1] DES Collaboration: Abbott T.M.C., et al. (2026)
[Constraints on Dynamical Dark Energy from Multiple Probes in the Full Dark Energy Survey](#)
Submitted to PRL
- [2] Popovic B., Shah P., Kenworthy W.D., et al. (2026)
[The Dark Energy Survey supernova program: a reanalysis of cosmology results and evidence for evolving dark energy with an updated Type Ia supernova calibration](#)
Monthly Notices of the Royal Astronomical Society, 548, stag632

- [3] DES Collaboration: Abbott T.M.C., Acevedo, M., et al. (2026)
[Dark Energy Survey: implications for cosmological expansion models from the final DES Baryon Acoustic Oscillation and Supernova data](#)
Physical Review D, 113, 063530
- [4] Dixon M., Mould J., Lidman C., et al. (2025)
[Calibrating the Absolute Magnitude of Type Ia Supernovae in Nearby Galaxies using \[OII\] and Implications for \$H_0\$](#)
Monthly Notices of the Royal Astronomical Society, 538, 782
- [5] Toy M., Wiseman P., Sullivan M., et al. (2025)
[Reduction of the type Ia supernova host galaxy step in the outer regions of galaxies](#)
Monthly Notices of the Royal Astronomical Society, 538, 181
- [6] Shah P., Davis T.M., Vincenzi M., et al. (2025)
[It is not \$\sigma_8\$: constraining the non-linear matter power spectrum with the Dark Energy Survey Year-5 supernova sample](#)
Monthly Notices of the Royal Astronomical Society, 537, 3814
- [7] Camilleri R., Davis T.M., et al. (2025)
[The Dark Energy Survey Supernova Program: An updated measurement of the Hubble constant using the Inverse Distance Ladder](#)
Monthly Notices of the Royal Astronomical Society, 537, 1818
- [8] Chen R., Scolnic D., Vincenzi M., et al. (2025)
[Evaluating Cosmological Biases using Photometric Redshifts for Type Ia Supernova Cosmology with the Dark Energy Survey Supernova Program](#)
Monthly Notices of the Royal Astronomical Society, 536, 1948
- [9] Shah P., Davis T.M., Vincenzi M., et al. (2025)
[Constraints on compact objects from the Dark Energy Survey five-year supernova sample](#)
Monthly Notices of the Royal Astronomical Society, 536, 946
- [10] Popovic B., Wiseman P., Sullivan M., et al. (2024)
[Modelling the impact of host galaxy dust on type Ia supernova distance measurements](#)
Monthly Notices of the Royal Astronomical Society, 534, 2263
- [11] White R.M.T., Davis T.M., Lewis G.F., et al. (2024)
[The Dark Energy Survey Supernova Program: Slow supernovae show cosmological time dilation out to \$z \sim 1\$](#)
Monthly Notices of the Royal Astronomical Society, 533, 3365
- [12] Camilleri R., Davis T.M., et al. (2024)
[The Dark Energy Survey Supernova Program: Investigating Beyond- \$\Lambda\$ CDM](#)
Monthly Notices of the Royal Astronomical Society, 533, 2615
- [13] Möller A., Wiseman P., et al. (2024)
[The Dark Energy Survey 5-year photometrically classified type Ia supernovae without host-galaxy redshifts](#)
Monthly Notices of the Royal Astronomical Society, 533, 2073
- [14] Shah P., Davis T.M., et al. (2024)
[The Dark Energy Survey : Detection of weak lensing magnification of supernovae and constraints on dark matter haloes](#)
Monthly Notices of the Royal Astronomical Society, 532, 932
- [15] Qu H., Sako M., Vincenzi M., et al. (2024)
[The Dark Energy Survey Supernova Program: Cosmological Biases from Host Galaxy Mismatch](#)

Talks

Center for Computational Astrophysics Cosmology & ML Lunch (Invited) Oct. 2024
“Wavelength-dependent atmospheric effects: Towards High-Precision Type Ia Supernova Cosmology” New York City, New York

Princeton/IAS Cosmology Lunch (Invited) Sept. 2024
“Wavelength-dependent atmospheric effects: Towards High-Precision Type Ia Supernova Cosmology” Princeton, New Jersey

Cosmology from Home 2024 June 2024
“Astrometric Redshifts of Supernovae” virtual
 • https://www.youtube.com/watch?v=_hF7QZ_gbSE

Dark Energy Survey Collaboration Meeting May 2024
“DES-LSST Synergies: Wavelength-dependent Atmospheric Effects” S’Agaró, Spain

Fink-Brazil Workshop May 2024
“Astrometric Redshifts of Supernovae in the Rubin LSST era” Rio de Janeiro, Brazil

LSST-DESC JuDO (Junior Members) short colloquia March 2024
“The Stability of the BAO Linear Point under Modified Gravity” virtual

Invited Talk at Yonsei University Dec. 2023
“Exploring the non-Gaussianity of the CIB and Its Gravitational Lensing” Seoul, South Korea

IPMU Time Domain Workshop Dec. 2023
“Astrometric Redshifts of Supernovae” Kashiwa, Japan

Cosmology from Home 2023 July 2023
“Exploring the non-Gaussianity of the CIB and Its Gravitational Lensing” virtual
 • https://www.youtube.com/watch?v=CEkQ_mHEB00

Particle Physics and Cosmology 2023 June 2023
“Exploring the non-Gaussianity of the CIB and Its Gravitational Lensing” Daejeon, South Korea

Dark Energy Survey Collaboration Meeting Jan. 2023
“The Dark Energy Survey Supernova Program: Corrections on photometry due to wavelength-dependent atmospheric effects” Portsmouth, UK

ZTF-DES Supernova Cosmology Workshop July 2022
“The Dark Energy Survey Supernova Program: Corrections on photometry due to wavelength-dependent atmospheric effects” Stockholm, Sweden

Dark Energy Survey Collaboration Meeting May 2022
“The Dark Energy Survey Supernova Program: Corrections on photometry due to wavelength-dependent atmospheric effects” Durham, North Carolina

Posters

LSST Dark Energy Science Collaboration Meeting July 2024
“Astrometric Redshifts of Supernovae” Zürich, Switzerland

Dark Energy Survey Collaboration Meeting May 2024
“Astrometric Redshifts of Supernovae” S’Agaró, Spain

Cosmology in Miramare “Astrometric Redshifts of Supernovae”, “Exploring the non-Gaussianity of the CIB and Its Gravitational Lensing”	Sept. 2023 Trieste, Italy
CMB-S4 Collaboration Meeting “Exploring the non-Gaussianity of the CIB and Its Gravitational Lensing”	Aug. 2023 Stanford, CA
LSST Dark Energy Science Collaboration Meeting “Astrometric Redshifts of Supernovae”	July 2023 Stanford, CA
American Astronomical Society Winter Meeting “The Dark Energy Survey Supernova Program: Corrections on photometry due to wavelength-dependent atmospheric effects”	January 2023 Seattle, Washington
https://aas241-aas.ipostersessions.com/?s=FB-2D-A1-75-B1-60-73-5B-AC-1F-39-E7-A1-A2-78-9B	

Teaching Experience - at the University of Pennsylvania

ASTR001 Survey of the Universe	Teaching Assistant	Fall 2020
ASTR006 Solar System and Exoplanets		
PHYS151 Principles of Physics II: Electromagnetism and Radiation	Teaching Assistant	Spring 2021
PHYS358 Data Analysis for the Natural Sciences I	Teaching Assistant	Fall 2022
PHYS351 Analytical Mechanics	Teaching Assistant	Spring 2023
PHYS531 Quantum Mechanics (graduate course)	Teaching Assistant	Fall 2023
PHYS100 Foundations of Data Science	Teaching Assistant	Spring 2024
PHYS531 Quantum Mechanics (graduate course)	Teaching Assistant	Fall 2024

Mentorship Experience

UW Madison Graduate Student Ellie Gates (with Professor Bechtol) “Projection effects on w_0w_a CDM”	May 2026 - present
LSST-DESC Mentorship Program	April 2026 - present
Panelist and Mentor for DEEPenn STEM 2024 Diversity Equity Engagement at Penn in STEM 2024: Full weekend of orientation activities for undergraduate students interested in Ph.D. programs, especially from underrepresented backgrounds Panelist: How to Navigate the PhD Life & Build a Supportive Network & Mentor	Fall 2024
Pathways to Ph.D. Mentor Full-day workshop and follow-up mentorship on applying to graduate schools and fellowships in the U.S. Mentored 5 students	Fall 2023 - Spring 2025
Penn Physics and Astronomy Peer Mentorship Program Monthly meetings with 1st year PhD students to provide guidance in research and professional development. Mentored 6 students	Fall 2022 - Spring 2025
Penn Undergrad Emma Yao (with Professor Madhavacheril) Co-supervision on “Prior volume/projection effects on w_0w_a CDM using Pantheon+ data”	June 2024 - present

Penn Physics and Astronomy GRAD Mentor

Fall 2021 - Spring 2022

Mentorship program on applying to graduate school organized by Penn Physics and Astronomy students

Mentored 2 students

Outreach

Speaker

April 2026

Astronomy on Tap - Yerkes Observatory $\times$ Duesterbeck's

Elkhorn, Wisconsin

- Pub talk on "Type Ia Supernova Cosmology and the Cosmological 'Constant' "

Speaker

October 2024

Astronomy on Tap

Philadelphia, Pennsylvania

- Pub talk on "Measuring Cosmological 'Distances' Using Our Own Atmosphere"

Speaker

June 2022

Astronomy on Tap

Philadelphia, Pennsylvania

- Pub talk on "Where We Might Find Aliens, Under the Ice"

Volunteer

February 2019 - August 2019

AstroTours at the University of Toronto

Toronto, Ontario, Canada

- A once-a-month public event; demonstrated the WWT (World Wide Telescope) and Oculus Rift (Virtual Reality)

Volunteer

May 2019

Science Rendezvous at the University of Toronto

Toronto, Ontario, Canada

- A public event with the Department of Astronomy and Astrophysics; explained 3D printed models of several asteroid missions as well as planetary features

Skills

**Programming Languages/Tools
Languages**

Python, C++, L^AT_EX

Fully bilingual in Korean and English

Other Interests

- Violin/Piano (Formerly a violinist at the Penn Symphony Orchestra and Korea University Orchestra, performed in 10+ concerts)
- Traveling (been to 30+ countries)