

Jaemyoung (Jason) Lee

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Research Interests

SN Ia Cosmology: Scene modeling photometry, wavelength-dependent atmospheric effects, astrometric/photometric redshifts, host-galaxy environmental effects

- Key contributor to the Dark Energy Survey Supernova Working Group (DES-SNWG)
- Key contributor to the Vera C. Rubin Observatory Legacy Survey of Space and Time - Dark Energy Science Collaboration (LSST-DESC) Time Domain (TD) Working Group and the Pixels-to-Light-Curves (PLC) Working Group

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*July 2024 - Apr. 2025**Department of Physics and Astronomy (University of Pennsylvania)**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*May 2019 - Aug. 2019**Canadian Institute for Theoretical Astrophysics**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

Workshop Co-Investigator*Sept. 2026**Enabling Time-Domain Science with LSST EDP2 Workshop in Pittsburgh, PA***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., Rubin D., et al. (2026)
Supernovae Unite: A joint measurement of the Hubble constant and the sound horizon in preparation
- [2] **Lee J.**, Camilleri, R., Davis, T., Rubin D., et al. (2026)
Supernovae Unite: Host-Galaxy Mass Measurements of Type Ia Supernovae and Their Impact on Cosmology
[arXiv: 2609.05321](#), submitted to *The Astrophysical Journal*
[Cosmology Talks YouTube Link](#)

- [3] Camilleri, R., **Lee J.**, Davis, T., Rubin D., et al. (2026)
[Supernovae Unite: Combining Pantheon+ and DES-SN5YR](#)
arXiv: 2609.05053, submitted to the Publications of the Astronomical Society of Australia
[Cosmology Talks YouTube Link](#)
- [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 of Type Ia Supernovae

The Astrophysical Journal, 964, 134

Talks

Cosmology Talks

Sept. 2026

“Cosmology from Combining Pantheon+ and DES-Dovekie” (Camilleri, Lee, and Davis) virtual

- <https://www.youtube.com/watch?v=KT-j65gRn00Q>

LSST Dark Energy Science Collaboration Meeting

July 2026

“The LSST-DESC Pixels-to-Light-Curves Working Group Mini-SMP Challenge” Boston, Massachusetts

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

“The Dark Energy Survey Supernova Program: Corrections on photometry due to wavelength-dependent atmospheric effects”

Jan. 2023
Portsmouth, UK

ZTF-DES Supernova Cosmology Workshop

“The Dark Energy Survey Supernova Program: Corrections on photometry due to wavelength-dependent atmospheric effects”

July 2022
Stockholm, Sweden

Posters**LSST Dark Energy Science Collaboration Meeting**

“Astrometric Redshifts of Supernovae”

July 2024
Zürich, Switzerland

Dark Energy Survey Collaboration Meeting

“Astrometric Redshifts of Supernovae”

May 2024
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)

May 2026 - present

“Projection effects on $w_0 w_a$ CDM”

LSST-DESC Mentorship Program

April 2026 - present

Panelist and Mentor for DEEPenn STEM 2024

Fall 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*

Pathways to Ph.D. Mentor

Fall 2023 - Spring 2025

Full-day workshop and follow-up mentorship on applying to graduate schools and fellowships in the U.S.

Mentored 5 students

Penn Physics and Astronomy Peer Mentorship Program

Fall 2022 - Spring 2025

Monthly meetings with 1st year PhD students to provide guidance in research and professional development.

Mentored 6 students

Penn Undergrad Emma Yao (with Professor Madhavacheril)

June 2024 - present

Co-supervision on “Prior volume/projection effects on w_0w_a CDM using Pantheon+ data”

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

Volunteer

April 2026

PEOPLE PSU 4 Program

Madison, Wisconsin

- Outreach event for high-school students interested in astronomy; explained how we can use the Rubin Observatory to explore our universe

Speaker

April 2026

Astronomy on Tap - Yerkes Observatory × 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)