Jaemyoung (Jason) Lee

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Research Interests

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

Postdoctoral Research Associate — *University of Wisconsin Madison*
Advisor: Keith Bechtol — *Sept. 2025 -*

Postdoctoral Research Associate — *University of Pennsylvania*
Advisor: Masao Sako — *May 2025 - Aug. 2025*

Military Service as an English Interpreter — *Army Signal School, South Korea*
Discharged as a sergeant on March 1st, 2016 — *June 2014 - Mar. 2016*

Education and Employment

Ph.D. in Physics and Astronomy — *University of Pennsylvania*
Advisors: Masao Sako & Ravi Sheth, M.S. in August 2022 — *Aug. 2020 - May 2025*

B.S. in Physics and B.A. in English Language and Literature — *Korea University*
Dual major — *Mar. 2013 - Feb. 2020*

Study Abroad — *University of Toronto*
Engaged in undergraduate research with J. Richard Bond's group — *Sept. 2018 - Apr. 2019*

Awards and Honors

Dissertation Completion Fellowship — *July 2024 - Apr. 2025*
Department of Physics and Astronomy (University of Pennsylvania) — *Philadelphia, Pennsylvania*

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

Publications

Lead author publications

[1] **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

[2] **Lee J.**, Sako, M., Kessler, R., Malz, A.I., and the LSST DESC Collaboration (2024)
Astrometric Redshifts of Supernovae
The Astrophysical Journal, 977, 199

[3] **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

[4] **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

[5] **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] DES Collaboration: Abbott T.M.C., Acevedo, M., et al. (2024)
Dark Energy Survey: implications for cosmological expansion models from the final DES Baryon Acoustic Oscillation and Supernova data
arXiv: 2503.06712, submitted to PRD

[2] 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?"
arXiv: 2501.06664, accepted by MNRAS

[3] 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

[4] Vincenzi M., Brout D., et al. (2024)
The Dark Energy Survey Supernova Program: Cosmological Analysis and Systematic Uncertainties
The Astrophysical Journal, 975, 86

[5] 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] 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

[2] 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

[3] 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

[4] 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

[5] 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

[6] 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

[7] 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

[8] Camilleri R., Davis T.M, et al. (2024)
The Dark Energy Survey Supernova Program: Investigating Beyond-ΛCDM
Monthly Notices of the Royal Astronomical Society, 533, 2615

[9] 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

[10] 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

[11] 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

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_mHEBO0

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 *Sept. 2023*
"Astrometric Redshifts of Supernovae", "Exploring the non-Gaussianity of the CIB and Its Gravitational Lensing" *Trieste, Italy*

CMB-S4 Collaboration Meeting *Aug. 2023*
"Exploring the non-Gaussianity of the CIB and Its Gravitational Lensing" *Stanford, CA*

LSST Dark Energy Science Collaboration Meeting *July 2023*
"Astrometric Redshifts of Supernovae" *Stanford, CA*

American Astronomical Society Winter Meeting *Januaray 2023*
"The Dark Energy Survey Supernova Program: Corrections on photometry due to wavelength-dependent atmospheric effects" *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 Survery 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 - at the University of Pennsylvania

Panelist and Mentor for DEEPenn STEM 2024 *Fall 2024 - present*
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 - present*
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 - present*
Monthly meetings with 1st year PhD students to provide guidance in research and professional development.

Mentored 6 students so far.

Penn Undergrad Emma Yao (with Professor Madhavacheril) *June 2024 - present*
Co-supervision on "Prior volume/projection effects on w_0w_aCDM 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

Services

Referee for ApJ, PRD and PRL *Sept. 2024 - present*

Outreach

Speaker *October 2024*
Astronomy on Tap *Philadephia, Pennsylvania*

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

Speaker *June 2022*
Astronomy on Tap *Philadephia, 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	Python, C++, LaTeX
Languages	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)