

Jaemyoung (Jason) Lee

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Department of Physics and Astronomy, University of Pennsylvania

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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-SN WG)
- 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), Cosmic Infrared Background (CIB), weak gravitational lensing, higher-order statistics

Education and Employment

Ph.D. Candidate in Physics and Astronomy *University of Pennsylvania*
Advisor: Masao Sako, M.S. in August 2022 *September 2020 - Present*

B.S. in Physics and B.A. in English Language and Literature *Korea University*
Dual major *March 2013 - February 2020*

Study Abroad *University of Toronto*
Engaged in undergraduate research & took numerous astronomy courses *September 2018 - April 2019*

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

Research Experience

Graduate Researcher *September 2021 - Present*
Department of Physics and Astronomy, University of Pennsylvania *Philadelphia, Pennsylvania*

- Advisor: Masao Sako

Undergraduate Researcher *September 2018 - August 2019*
Canadian Institute for Theoretical Astrophysics, University of Toronto *Toronto, Ontario, Canada*

- Advisors: J. Richard Bond, Alexander van Engelen, Pavel Motloch, George Stein

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

Lead author publications

- [1] **Lee J.**, Fiorini, B., Nikakhtar, F., and Sheth, R.K.
[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
[Astrometric Redshifts of Supernovae](#)
arXiv: 2405.04522, submitted to The Astrophysical Journal
- [3] **Lee J.**, Bond J.R., Motloch P., van Engelen A. and Stein G. (2023)
[Exploring the Non-Gaussianity of the Cosmic Infrared Background and Its Weak Gravitational Lensing](#)
Monthly Notices of the Royal Astronomical Society, 529, 2543
- [4] **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., Zeurher 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] Sánchez B.O., Brout D., Vincenzi M., ..., **Lee J.**, et al. (2024)
[The Dark Energy Survey Supernova Program: Light curves and 5-Year data release](#)
arXiv: 2406.05046
- [2] DES Collaboration: Abbott T.M.C., Acevedo, M., ..., **Lee J.**, et al. (2024)
[The Dark Energy Survey: Cosmology Results With 1500 New High-redshift Type Ia Supernovae Using The Full 5-year Dataset](#)
arXiv: 2401.02929, submitted to The Astrophysical Journal
- [3] Vincenzi M., Brout D., ..., **Lee J.**, et al. (2024)
[The Dark Energy Survey Supernova Program: Cosmological Analysis and Systematic Uncertainties](#)
arXiv: 2401.02945, submitted to The Astrophysical Journal

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

- [1] Popovic B., Wiseman P., Sullivan M., ..., **Lee J.**, et al. (2024)
[Modelling the impact of host galaxy dust on type Ia supernova distance measurements](#)
arXiv: 2406.05051, submitted to MNRAS
- [2] White R.M.T., Davis T.M., Lewis G.F., ..., **Lee J.**, et al. (2024)
[The Dark Energy Survey Supernova Program: Slow supernovae show cosmological time dilation out to \$z \sim 1\$](#)
arXiv: 2406.05050, submitted to MNRAS
- [3] Camilleri R., Davis T.M., ..., **Lee J.**, et al. (2024)
[The Dark Energy Survey Supernova Program: An updated measurement of the Hubble constant](#)

using the Inverse Distance Ladder

arXiv: 2406.05049, submitted to MNRAS

- [4] Camilleri R., Davis T.M., ..., **Lee J.**, et al. (2024)
The Dark Energy Survey Supernova Program: Investigating Beyond- Λ CDM
arXiv: 2406.05048, submitted to MNRAS
- [5] Shah P., Davis T.M., ..., **Lee J.**, et al. (2024)
The Dark Energy Survey : Detection of weak lensing magnification of supernovae and constraints on dark matter haloes
arXiv: 2406.05047, accepted by MNRAS
- [6] Qu H., Sako M., Vincenzi M., ..., **Lee J.**, et al. (2024)
The Dark Energy Survey Supernova Program: Cosmological Biases from Host Galaxy Mismatch of Type Ia Supernovae
The Astrophysical Journal, 964, 134
- [7] Möller A., Wiseman P., ..., **Lee J.**, et al. (2024)
The Dark Energy Survey 5-year photometrically classified type Ia supernovae without host-galaxy redshifts
arXiv: 2402.18690, submitted to MNRAS

Selected Talks

- “Astrometric Redshifts of Supernovae in the Rubin LSST era” *May 2024*
Centro Brasileiro de Pesquisas Físicas *Rio de Janeiro, Brazil*
- Fink-Brazil Workshop 2024
- “Exploring the non-Gaussianity of the CIB and Its Gravitational Lensing” *June 2023*
Institute for Basic Science *Daejeon, South Korea*
- PPC 2023 Cosmology Session Parallel talk
- “The Dark Energy Survey Supernova Program: Corrections on photometry due to wavelength-dependent atmospheric effects” *July 2022*
Stockholm University *Stockholm, Sweden*
- On behalf of DES SNWG at the ZTF-DES Supernova Cosmology Workshop

Selected Posters

- “The Dark Energy Survey Supernova Program: Corrections on photometry due to wavelength-dependent atmospheric effects” *January 2023*
American Astronomical Society Winter Meeting Supernovae Poster Session *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	<i>Fall 2020</i>
ASTR006 Solar System and Exoplanets		
PHYS151 Principles of Physics II: Electromagnetism and Radiation	Teaching Assistant	<i>Spring 2021</i>
PHYS358 Data Analysis for the Natural Sciences I	Teaching Assistant	<i>Fall 2022</i>
PHYS351 Analytical Mechanics	Teaching Assistant	<i>Spring 2023</i>
PHYS531 Quantum Mechanics (graduate course)	Teaching Assistant	<i>Fall 2023</i>
PHYS100 Foundations of Data Science	Teaching Assistant	<i>Spring 2024</i>

Skills

Programming Languages/Tools Python, C++, L^AT_EX
Languages Fully bilingual in Korean and English

Outreach

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

Other Interests

- Violin/Piano (Currently a violinist at the Penn Symphony Orchestra, performed in 8 concerts)
- Traveling (been to 30+ countries)