

Minjae Kim

Undergraduate Student in Physics at KAIST

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Research Interests

- Cosmology & High-Redshift Universe** (Quasars, Supermassive Black Holes)
- Galaxy Formation & Evolution** (Circumgalactic Medium)
- Computational Astrophysics** (Simulation & Machine Learning, Causal Inference)

Education

- 2020– Present **B.S. in Physics, Minor in Electrical Engineering**, KAIST, Daejeon, South Korea
Cumulative GPA: **3.90/4.3** (Major: **3.96/4.3**)
- 2024 Summer **Summer Exchange Student**, UC Berkeley Summer Session, Berkeley, USA
Completed coursework in Introduction to Astrophysics.
- 2018– 2019 **Jeonnam Science High School**, Naju, South Korea
Early Graduation (Ranked 2nd in School)

Research Experience

- Jan 2026– Present **Research Intern (SPHEREx team)**, Korea Astronomy and Space Science Institute (KASI), Daejeon, Advisor: Dr. Bomee Lee & Dr. Woong-Seob Jeong
 - Conducting spectral analysis of Quasars with very high redshift ($z > 5$) using SPHEREx survey data.
 - Developing automated fitting pipelines to identify spectral peaks and estimate physical parameters.
- Sep 2024– Present **Undergraduate Researcher (OBSCAL Group)**, KAIST, Daejeon, Advisor: Prof. Junhan Kim
 - Project: Probing Hot gas Components of Circumgalactic Medium (CGM) Through X-ray Signatures.
 - Conducting follow-up research focusing on machine learning-based causal inference techniques.
- Jun 2025– Dec 2025 **International Visiting Student Researcher**, UC Santa Cruz, CA, USA, Advisor: Prof. Puragra Guha Thakurta
 - Project: Kinematical Analysis of M32 - A Comparative Study of Serendipitously Observed Versus Targeted Stars and Assessment of Spectral Blending.
 - Participated in the UCSC International Summer Research Program (ISRP).

Teaching & Mentoring

- Sep 2025– Dec 2025 **Undergraduate Tutor (General Physics II)**, KAIST, Daejeon
Mentored KAIST freshmen, facilitating a deeper understanding of core physics concepts through weekly review sessions.
- Summer 2025 **Science Internship Program (SIP) Mentor**, UC Santa Cruz, CA, USA
Supervised a research group of 3 high school interns. Successfully guided one intern to present their research findings at the **247th American Astronomical Society (AAS) Meeting** (Jan 2026).

Publications & Presentations

- Oct 2025 **Poster Presentation**, *Probing Hot gas Components of CGM Through X-ray Signatures*, Korea Physical Society (KPS) Fall Meeting
Awarded Outstanding Presentation. (Selected to present at **APRIM 2026**, Hong Kong)

Summer 2025 **Oral Presentation**, *Kinematical Analysis of M32: A Comparative Study of Serendipitously Observed Versus Targeted Stars*, UCSC SIP Symposium

Honors & Awards

- Fall 2025 **Tech Innovator Recognition**, NASA Space Apps Challenge, Seoul (Project: *Geese Crossing*)
- Fall 2025 **Excellent Award**, KAIST Undergraduate Research Program (URP)
- Fall 2025 **Excellent Award**, KPS Undergraduate Physics Research Competition
- Spring 2025 **Outstanding Presentation Awards**, Korea Physical Society (KPS)
- Spring 2025 **Departmental Honor Scholarship & Dean's list**, Department of Physics, KAIST
- 2020 **KAIST Presidential Fellowship**
- 2020 **National Science & Technology Scholarship**
- 2019 **Hanseong Son JaeHan Scholarship**

Selected Coursework

- Physics Quantum Mechanics I & II, Classical Electromagnetism I, Statistical Physics, Solid State Physics I, Mathematical Methods in Physics I & II
- Astrophysics Astrophysics, Radio Astronomy, Introduction to Astrophysics (UC Berkeley), Computational Physics

Skills & Extracurriculars

- Programming Python (pandas, numpy, astropy, matplotlib, torch), Git, L^AT_EX
- Languages Korean (Native), English (TOEFL 103)
- Extracurricular Member, NUPS (Exoplanet Exploration Club) (Spring 2025– Present)

Military Service

- Jan 2022– Republic of Korea Army, Honorable Discharge (Sergeant)
Jul 2023