Yubin Kim

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RESEARCH INTERESTS

Astrophysics, Gravitational wave, Multi-messenger astronomy, Machine learning, Data analysis

EDUCATION

Ewha Womans University, Seoul, South Korea — *Mar. 2020 – Feb. 2026*
Bachelor of Science in Physics — Cumulative GPA: 3.84 / 4.30
Minors in Mathematics and Philosophy

Relevant Coursework

- Astrophysics: Astrophysics (A+), Particle Physics (A+), Astrodynamics
- Computing: Computational Physics (A+), Scientific Computation Programming
- Mathematics: Digital Image Processing, Numerical Analysis, Differential Equations, Mathematical Physics

RESEARCH EXPERIENCE

Full-time Research Intern (PI: John Oh) — Daejeon, South Korea
National Institute for Mathematical Sciences — *Mar. 2026 — Present*

- Developed DECAGMon, a tool designed to correlate auxiliary channels with transient noise in gravitational wave detectors.
- Managed superconducting gravimeters at the Yemi gravity observatory to analyze Newtonian noise.

Undergraduate Research Intern (Advisors: Prof. Kyujin Kwak) — Ulsan, South Korea
Computational Astrophysics Lab, Ulsan National Institute of Science and Technology — *July 2025 — Feb. 2026*

- Developed unsupervised deep learning tools for glitch classification and successfully applied them to LIGO and KAGRA detector datasets.
- Developed machine learning models utilizing photometric and spectroscopic data from Gaia and SDSS to predict astronomical distances.

Undergraduate Research Intern (Advisors: Prof. Hyunggu Jung) — Seoul, South Korea
Human-Centered Artificial Intelligence Lab, Seoul National University — *Jan. 2024 — Feb. 2025*

- Conducted a systematic literature review on deep learning applications for gravitational wave data quality analysis.
- Explored the capabilities of multimodal large language models in interpreting and inferring gravitational wave spectrograms.
- Investigated carbon emission measurement and visualization tools for AI models through a systematic literature review.

Undergraduate Research Intern (Advisors: Prof. Chunglee Kim) — Seoul, South Korea
Astrophysics Lab, Ewha Womans University — *Dec. 2022 — Nov. 2023*

- Updated astrophysical S-factor data for carbon nuclear fusion through a literature review, calculated revised nuclear reaction rates, and investigated their impacts on massive star evolution.
- Trained in Linux environments and Python-based data analysis tools for processing gravitational wave public data.

PUBLICATIONS & PRESENTATIONS

Journal paper

- Seong, G., **Kim, Y.**, Kwak, K., Ahn, S., Park, C., Hahn, K. I., & Kim, C. (2024). 12C+12C Reaction Rates and the Evolution of a Massive Star. *Journal of The Korean Astronomical Society*, **57**(2), 115–122. (Co-first author, Published) https://doi.org/10.5303/JKAS.2024.57.2.115
- **Kim, Y.**, Min, J. & Jung, H. "Capability of Multimodal Large Language Models to Describe Gravitational Wave Images." (First author, Submitted)

Proceeding

- **Kim, Y.**, Moon, Y., Son, J., Park, M., Min, J., & Jung, H. (2025). Analysis of the Tools for Measuring and Visualizing AI Model Carbon Emissions: A Systematic Review. *Proceedings of the HCI Korea Conference*, Gangwon, South Korea. (Oral Presentation, Co-first author)

Presentation

- (Oral) **Kim, Y.**, Jung, K. & Kwak, K. (2025), Deep Embedded Clustering for Classifying the Transient Noise of KAGRA, 2025 ENIGMA Collaboration Workshop on Astrophysics and Geophysics, Student Contribution Talk, 9-13, Nov.

- (Oral) **Kim, Y.** & Kwak, K. (2025), Unsupervised Deep Learning for Clustering Gravitational Wave Glitch Spectrograms, 112th Korea Astronomy Society Fall Meeting, 15-17, Oct.
- (Poster) **Kim, Y.**, Kim, B. & Oh, J. (2026), DECAGMon: Tool for identifying correlation and coherence between multi-channels by measuring information-theoretic index, JpGU-AGU Joint Meeting 2026, 23-39, May
- (Poster) **Kim, Y.**, Jung, K. & Kwak, K. (2025), Unsupervised Deep Learning for KAGRA Transient Noise Classification, 13th KAGRA International Workshop, 18-19, Dec.

HONORS & SCHOLARSHIPS

Undergraduate Major Leadership Scholarship, Ewha Womans University *Fall 2023, Fall 2024*
Korea Toray Science Foundation Scholarship *Spring 2024*
Ewha Womans University Department of Physics Alumni Scholarship *Spring 2022, Fall 2023*
KB Foundation Scholarship for Basic Science *Spring 2023*
Jicheon Scholarship, Ewha Womans University *Fall 2022, Spring 2022*

Dean's List(for 5 semesters), Ewha Womans University *2021 Fall, 2022 Spring & Fall, 2023 Fall, 2024 Fall*

EXTRACURRICULAR ACTIVITIES

Academic and Leadership Activities

- Participant, AstroAI Asian Network Summer School (Selected as a best group presentation) *2025*
- Encouragement Award, AI-Based Learning Methods Contest, Ewha Womans University *2025*
- Participant, Gravitational-Wave and Numerical Relativity Winter School *2023, 2026*
- Participant, Gravitational-Wave and Numerical Relativity Summer School *2023, 2024*
- Oral Presentation (1st Place), College of Natural Sciences Academic Festival, Ewha Womans University *2023*
- Executive Member, Department of Physics Student Council, Ewha Womans University *2022–2023*
- Member, EPAD (Ewha Physics Academic Club), Ewha Womans University *2022*
- Member, ECC (Ewha Computer Club), Ewha Womans University *2021*

Teaching Experience

- Private Math Tutor for High School Students, QANDA Online Tutoring Platform *Mar. 2025– Dec. 2025*
- Peer Tutor, Ewha Womans University *2025*
- Math Tutor for High School Students, Dragon Math Academy (Part-time) *June 2022 – Dec. 2022*
- Private Tutor in High School and Middle School Physics and Mathematics *2021 – 2023*

Mentoring and Outreach

- Researcher Mentor *Mar. 2026 – Aug. 2026*
  Sejong City Office of Education & National Institute for Mathematical Sciences
  Mentored middle school students in a real-world mathematics exploration project with researchers
- Volunteer Lecturer *Sep. 2025 – Feb. 2026*
  WeMajor (Seoul Metropolitan Government-affiliated nonprofit educational outreach organization)
  Participated in academic outreach activities by delivering major-related lectures and mentoring for middle school students
- High School Outreach Volunteer *May 2023*
  Ewha Womans University Office of Admissions (a university outreach ambassador program)
  Conducted outreach presentations on academic majors and university admissions for high school students

SKILLS

Programming Languages : Python; Matlab (basic)
Machine Learning Frameworks : PyTorch, TensorFlow, Scikit-learn
Research Tools : LaTeX (academic writing and editing), Linux, Jupyter Notebook, GitHub
Languages: Korean (native), English (fluent), Japanese (beginner)

ENGLISH TESTS

TOEFL iBT: 5.0 / 6.0 (R: 5.5, L: 5.5, W: 4.5, S: 5.0) *May 2026*
OPIc (Oral Proficiency Interview): IH (Intermediate High) *Mar. 2025*