

Hyeonjae Kim

Email: hyeonjae.amo@gmail.com

hyeonjae@add.re.kr

Website: hyeonjae.com

Research Officer at the Agency for Defense Development

Education

Kyungpook National University (KNU)

Daegu, Republic of Korea

Bachelor of Science in Physics

Mar. 2020 – Feb. 2024

Overall GPA: 4.11/4.3 (3.95/4.0) | Major GPA (71 credits): 4.19/4.3 (3.99/4.0)

Research Experiences

Agency for Defense Development (ADD)

Daejeon, Republic of Korea

Research Officer (Supervisors: Dr. Sin Hyuk Yim, Dr. Sangkyung Lee)

Jun. 2024 – May 2027 (expected)

Research in atomic physics and quantum sensing

- Designed and implemented an automated absorption spectroscopy system to characterize rubidium vapor cell properties
- Built and optimized a zero-field (SERF) optically pumped magnetometer for magnetic noise measurements
- Conducted magnetic-anomaly detection experiments and data analysis using a portable single-beam optically pumped magnetometer

Novel Applied Nano Optics Lab

Daegu, Republic of Korea

Research Intern (Advisor: Prof. Junyeob Yeo)

Jun. 2021 – Jun. 2022

Project: Fabrication of a flexible photo-electrochemical cell using laser

High Energy Physics Lab (Moon Lab)

Daegu, Republic of Korea

Research Intern (Advisor: Prof. Chang-Sung Moon)

Jun. 2020 – Feb. 2021

Developed momentum reconstruction algorithms for silicon detector simulations

Publications

Novel sealing of glass-blown atomic gas cells using resistive heating wires

Manuscript under review

S. H. Hong, Y. Lim, S. H. Yim, S. Lee, H. Kim, T. Jeong, and J. B. Nam

Aging test of an atomic vapor cell with Al₂O₃ wall coating on cubic glass

Applied Optics **64**, 7932-7937 (2025)

H. Kim, T. Jeong, S. H. Hong, J. B. Nam, S. Lee, Y. Lim, and S. H. Yim

Selected Conference Presentations

Probing magnetic noise from portable sensor components using a zero-field optically pumped magnetometer

APS Division of Atomic, Molecular, and Optical Physics (DAMOP) Meeting, 2026 (scheduled)

Experimental systems for spectroscopy and zero-field OPM with atomic vapor cells

KISTI-SNU Joint workshop (QNRJ Joint Workshop), 2026 (invited, scheduled)

Towards the development of a SERF magnetometer

Korean Physical Society (KPS) Fall Meeting, 2025

Lifetime extension of rubidium vapor cells by Al₂O₃ coating

APS Division of Atomic, Molecular, and Optical Physics (DAMOP) Meeting, 2025

Linear absorption spectroscopy in rubidium vapor cells: Applications in buffer gas measurement and lifetime estimation

Korean Physical Society (KPS) Spring Meeting, 2025

Honors and Awards

Physics Alumni Association Award and Scholarship (Outstanding Graduate) Department of Physics Alumni Association, Kyungpook National University	Feb. 2024
2nd Prize, 2023 MiliTECH Challenge Hosted by KAIST; Awarded by the Agency for Defense Development	Dec. 2023
2nd Prize, 2022 MiliTECH Challenge Hosted by KAIST; Awarded by the Korea Military Academy (KMA)	Dec. 2022
3rd Prize of Academic Conference College of Natural Sciences, Kyungpook National University	Dec. 2021
Dean's List: 3 semesters (2021-1, 2021-2, 2022-2) College of Natural Sciences, Kyungpook National University	Nov. 2021, Apr. 2022, Apr. 2023

Grants and Scholarships

National Science and Technology Scholarship Korea Student Aid Foundation (KOSAF)	Mar. 2022 – Feb. 2024
Academic Merit Scholarship (Hyoseok Scholarship) Kyungpook National University Alumni Association	Apr. 2022
Academic Excellence Scholarship Kyungpook National University	Aug. 2020, Feb. 2021, Aug. 2021

Other Research Outputs

Buffer Gas Pressure Estimation for OPAMs Registered software; Korea Copyright Commission (C-2024-047156)	Dec. 2024
Rubidium Vapor Cell Lifetime Monitoring and Analysis Tool Registered software; Korea Copyright Commission (C-2024-054414)	Dec. 2024

Additional Experiences

Research Officer for National Defense (ROND) First Lieutenant in the Republic of Korea Air Force Selected as one of 20 research officers nationwide for STEM-based national defense research	Jun. 2024 – May 2027
Teaching Assistant, Classical Mechanics II (PHYS212)	Sep. 2023 – Dec. 2023
Teaching Assistant, Electromagnetism II (PHYS312)	Mar. 2023 – Jun. 2023
International Student Tutor	Feb. 2022 – May. 2022

Skills

Programming: Python, Wolfram Language (Mathematica)
Software: LabVIEW, SolidWorks, COMSOL Multiphysics