

Hyeonjae Kim

Researcher at Agency for Defense Development

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Education

Kyungpook National University (KNU)

Daegu, South Korea

Bachelor of Science in Physics

Mar. 2020 – Feb. 2024

Overall GPA: 4.11/4.3 (130 credits) | Major GPA: 4.19/4.3 (71 credits)

Research Experiences

Agency for Defense Development (ADD)

Daejeon, South Korea

Researcher (PIs: Dr. Sin Hyuk Yim, Dr. Sangkyung Lee)

Jun. 2024 – Present

Research on quantum sensing based on atomic systems

- Designed and implemented an automated absorption spectroscopy system for rubidium vapor cells based on atom–light interaction modeling
- Built and optimized a zero-field (SERF) optically pumped atomic magnetometer

Novel Applied Nano Optics Lab

Daegu, South 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, South Korea

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

Jun. 2020 – Feb. 2021

Publications

Aging test of an atomic vapor cell with Al_2O_3 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

Conference Presentations

Towards the development of a SERF magnetometer

Korean Physical Society (KPS) Fall Meeting (2025)

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

Lifetime extension of rubidium vapor cells by Al_2O_3 coating

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

H. Kim, T. Jeong, S. Lee, and S. H. Yim

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

Korean Physical Society (KPS) Spring Meeting (2025)

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

Honors and Awards

Physics Alumni Association Award and Scholarship (Outstanding Graduate)

Feb. 2024

Department of Physics Alumni Association, Kyungpook National University

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

Grants and Scholarships

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

Other Research Outputs

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

Additional Experiences

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

Skills

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