

Hyeonjae Kim

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Researcher at Agency for Defense Development

Research Interests

AMO Physics, Atom-light interaction, Quantum sensing, Quantum simulation, Quantum computing

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 Optically Pumped Atomic Magnetometers (OPAMs)

Novel Applied Nano Optics Lab

Daegu, South Korea

Research Intern (Advisor: Prof. Junyeob Yeo)

Jun. 2021 – Jun. 2022

Research on photo-electrochemical cells using lasers

High Energy Physics Lab (Moon Lab)

Daegu, South Korea

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

Jun. 2020 – Feb. 2021

Research on the development of algorithms for silicon detectors

Publications

Aging test of 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

Conferences

Towards the SERF regime in an atomic 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

Awarded by the chair of the Physics Alumni Association, Kyungpook National University	
Agency for Defense Development Director General's Award	Dec. 2023
2nd prize at the MiliTECH Challenge hosted by KAIST	
Korea Military Academy President's Award	Dec. 2022
2nd prize at the MiliTECH Challenge hosted by KAIST	
3rd prize of Academic Conference	Dec. 2021
Awarded by the College of Natural Sciences, Kyungpook National University	
Dean's list: 3 semesters (2021-1, 2021-2, 2022-2)	Nov. 2021, Apr. 2022, Apr. 2023
Awarded by the College of Natural Sciences, Kyungpook National University	

Grants and Scholarships

National Science and Technology Scholarship	Mar. 2022 – Feb. 2024
Awarded by the Korea Student Aid Foundation (KOSAF)	
Academic Encouragement Scholarship (Hyoseok Scholarship)	Apr. 2022
Awarded by the Kyungpook National University Alumni Association	
Outstanding students selected from each college (Representative of the College of the Natural Sciences)	
Academic Achievement Scholarship	Aug. 2020, Feb. 2021, Aug. 2021
Awarded by Kyungpook National University	
A partial tuition reduction granted for academic excellence	

Teaching Experiences

Undergraduate Tutoring in Classical Mechanics2 (PHYS212) Courses	Sep. 2023 – Dec. 2023
Teaching Assistant	
Undergraduate Tutoring in Electromagnetism2 (PHYS312) Courses	Mar. 2023 – Jun. 2023
Teaching Assistant	

Patents and Software

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

Other Experiences

Research Officer for National Defense (ROND)	Jun. 2024 – May. 2027
Selected top students (2 per year in Physics) for a program modeled after Israel's Talpiot, completing mandatory military service through research at the Agency for Defense Development, Korea's DARPA counterpart.	
Concurrently serving as a First Lieutenant in the Republic of Korea Air Force.	
Tutoring for International Undergraduate Freshmen	Feb. 2022 – May. 2022
Mentored for 2 hours per week on general academic life and basic calculus	
Selected as an excellent tutor	

Skills

- Programming: Python (NumPy, SciPy, SymPy, pandas, matplotlib), Wolfram Language (Mathematica)
- Software: LabVIEW, Solidworks