Hyeonjae Kim

Research Officers for National Defense at Agency for Defense Development

Email: hyeonjae.amo@gmail.com | hyeonjae@add.re.kr
Website: https://hyeonjaephys.github.io

Research Interests

AMO Physics, Quantum Sensing, Quantum Information

Education

Kyungpook National University (KNU), Daegu, Republic of Korea *Mar. 2020 – Feb. 2024*
Bachelor of Science in Physics
Overall GPA: 4.11/4.3 (130 credits) | Major GPA: 4.19/4.3 (71 credits)

Research Experiences

Agency for Defense Development, Daejeon, Republic of Korea *Jun. 2024 – Present*
Research Officers for National Defense (ROND)
Research on Atom-Based Quantum Sensors at 3rd R&D Institute

Novel Applied Nano Optics Lab, Daegu, Republic of Korea *Jun. 2021 – Jun. 2022*
Research Intern (Advisor: Prof. Junyeob Yeo)
Research on photo-electrochemical cells using optics

High Energy Physics Lab (Moon Lab), Daegu, Republic of Korea *Jun. 2020 – Feb. 2021*
Research Intern (Advisor: Prof. Chang-Sung Moon)
Research on Algorithm Development 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

Demonstration of atom spin gyroscope operating with high bandwidth over 100 Hz
APS Division of Atomic, Molecular and Optical Physics (DAMOP) Meeting (2025)
S. H. Yim, S. Lee, T. Jeong, S. H. Hong, and **H. Kim**

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 Alumini 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 the KAIST

Korea Military Academy President's Award *Dec. 2022*
2nd prize at the MiliTECH Challenge hosted by the 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)

Merit-based Scholarship *Aug. 2020, Feb. 2021, Aug. 2021*
Awarded by Kyungpook National University
Full tuition waiver for outstanding academic achievement

Teaching Experiences

Undergraduate Tutoring in Classical Mechanics2 (PHYS212) Courses *Sep. 2023 – Dec. 2023*
Teaching Assistant | Lectures for 2 hours once a week during the Fall 2023 semester

Undergraduate Tutoring in Electromagnetism2 (PHYS312) Courses *Mar. 2023 – Jun. 2023*
Teaching Assistant | Lectures for 2 hours once a week during the Spring 2023 semester

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

First Lieutenant at Republic of Korea Air Force *Jun. 2024 – May. 2027*
Research Officers for National Defense (Physics, 2/year), counterpart of Israel Talpiot

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

Python, LabVIEW, Wolfram Language (Mathematica)