

# Hyeonjae Kim

Researcher at Agency for Defense Development

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## Education

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### 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

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### 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)

- Designed and implemented an automated absorption spectroscopy system for rubidium vapor cells
- Developed atom-light interaction models for quantitative analysis of rubidium vapor cells
- 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

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### Aging test of an atomic vapor cell with $\text{Al}_2\text{O}_3$ 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

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### 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 $\text{Al}_2\text{O}_3$ 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

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### Physics Alumni Association Award and Scholarship (Outstanding Graduate)

Feb. 2024

Department of Physics Alumni Association, Kyungpook National University

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

## Grants and Scholarships

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

## Other Research Outputs

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

## Additional Experiences

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<b>Research Officer for National Defense (ROND)</b>	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	
<b>Teaching Assistant, Classical Mechanics II (PHYS212)</b>	Sep. 2023 – Dec. 2023
<b>Teaching Assistant, Electromagnetism II (PHYS312)</b>	Mar. 2023 – Jun. 2023

## Skills

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