

Seungmin Kim

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Education

University of Wisconsin–Madison

Master of Science in Physics – Quantum Computing

Madison, WI

Aug. 2025 – Expected Dec. 2026

Tokyo Metropolitan University

Bachelor of Science in Physics

Tokyo, Japan

Apr. 2019 – Mar. 2025

Research Experience

Graduate Student Researcher – Sinclair Lab

Sep. 2025 – Present

University of Wisconsin–Madison

Madison, WI

- Design modular optical subsystem layouts at 780, 795, and 852 nm for laser cooling, spectroscopy, and neutral-atom experiments using the PyOpticL code-to-CAD framework.
- Assemble, align, and test 780-nm optical subsystems supporting a rubidium-87 MOT, including spectroscopy, acousto-optic modulation, tapered-amplifier output, and fiber-coupling stages.
- Diagnose and document optical performance issues involving fiber-coupling efficiency, beam quality, polarization control, and saturated-absorption spectroscopy signals.
- Analyze the optical geometry of a pseudo-MOT using Gaussian-beam calculations and Zemax OpticStudio to evaluate combined 780- and 1530-nm beam propagation, waist placement, focusing, and retroreflection.

Graduate Researcher – Saffman Lab

May 2026 – Present

University of Wisconsin–Madison

Madison, WI

- Contribute to assembling and aligning a neutral-atom apparatus for a metasurface-based atom-array experiment.
- Operate and troubleshoot the rubidium MOT used for atom preparation by optimizing free-space beam alignment, magnetic-field settings, polarization conditions, and fluorescence imaging.

Laboratory Assistant

Apr. 2024 – Mar. 2025

Tokyo Metropolitan University

Tokyo, Japan

- Supported the daily operation of a research group by organizing shared workspaces and equipment and assisting with routine academic tasks.
- Prepared figures and visual materials for research presentations and academic documents.

Additional Experience

STEM Support Tutor

Oct. 2021 – Aug. 2024

Tokyo Metropolitan University

Tokyo, Japan

- Provided academic support in introductory university mathematics and physics for first-year undergraduate students through the university's STEM support program.

Private Tutor

Jun. 2019 – Jul. 2025

Self-Employed

- Provided individualized instruction in mathematics, physics, Japanese, and English, tailoring lesson plans to students' academic backgrounds and learning goals.

Military Service

Jul. 2022 – Jan. 2024

Ministry of National Defense, Republic of Korea

South Korea

- Completed mandatory national service through an alternative public-service assignment.

Technical Skills

Experimental Techniques: Magneto-Optical Trapping (MOT), Laser Beam Alignment, Fiber Coupling, Beat-note Locking, PID Laser Locking, Polarization Control, Magnetic-Field Optimization, Saturated Absorption Spectroscopy, Cavity Control

Optical Design: PyOpticL, Zemax OpticStudio, CAD (Fusion 360, SolidWorks)

Software: Python, ARTIQ, MATLAB, Git, LaTeX, Adobe Illustrator, Inkscape