

Seorhin Choi Curriculum Vitae

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EDUCATION

M.S. in Physics Ewha Womans University, Seoul	Expected 2027
B.S. in Physics B.A. in Philosophy (double majors) Ewha Womans University, Seoul	2025
High School Diploma Chungnam Samsung Academy, Asan	2020

RESEARCH EXPERIENCE

M.S. Researcher

Institute for Basic Science – Center for Quantum Nanoscience (QNS) 2025 – present

- Developed multiplet model for Er/MgO incorporating partially occupied 5d configurations; reproduced experimental g-tensor anisotropy from ESR-STM data via Bayesian optimization
- Extended modeling framework to Ho, Tm, and Dy adatoms on MgO
- Conducting XAS/XMCD data analysis of lanthanide atoms on superconductors to probe valence-electron magnetism and coupling to Cooper pairs

Synchrotron experiments

- Investigating lanthanide adatoms on superconductors – XAS / XMCD measurement (SOLEIL Synchrotron, France) 2025
- An element-specific XMCD study of $\text{Co}_{1/3}\text{TaS}_2$ (Pohang Accelerator Laboratory, Korea / SOLEIL Synchrotron, France) 2025, 2026
- XAS / XLD study of 2D Kagome spin ice (SOLEIL Synchrotron, France) 2026

Undergraduate Researcher

Institute for Basic Science – Center for Quantum Nanoscience (QNS) 2024

- Assisted in Cu (111) surface preparation (sputtering-annealing) and molecular deposition of YPC_2 , for STM/STS investigation of Kondo screening
- Assisted in low-temperature STM topography and STS measurements, identifying YPC_2 and HOMO/LUMO features on Cu(111)

Trapped Ion Quantum Computing Laboratory, Ewha W. Univ. 2023

- Built RF-driven AOM control system (RF generator, amplifier, AOM. Photodiode readout) using DAQ/MATLAB to generate TTL laser pulses for ion qubit control
- Implemented PID-based laser power stabilization

TEACHING EXPERIENCE

Teaching Assistant – General Physics Laboratory 2025 – 2026
Department of Physics, Ewha Womans University

- Guided undergraduate students in experimental setup, measurements, and data analysis
- Developed grading rubrics and evaluated laboratory reports

Private Tutor (Physics & Mathematics) 2020 – present

- Mentored 30+ students in middle, high-school mathematics and physics
- Taught linear algebra based on *Friedberg, Insel & Spence*

Mathematics Instructor 2022
Lim math, Cheonan

- Taught middle school mathematics in small-group classroom settings

HONORS AND SCHOLARSHIPS

Graduated Magna Cum Laude, Ewha Womans University 2025

Outstanding Ewha Scientist Scholarship, Ewha Womans University 2025 - 2026

PUBLICATIONS

Yaowu Liu*, Dasom Choi*, Stefano Reale, Jeongmin Oh, **Seorhin Choi**, Fang Lei, Wehyo Seo, Arzhang Ardavan, Andreas J. Heinrich, Soo-hyon Phark, and Fabio Donati, “All-electrical Coherent Control of a Single 4f Electron Spin”, submitted (2026).

*These authors contributed equally.

CONFERENCE PRESENTATIONS

“From States to Paths: Anyon braiding and the limits of state-based analysis”, Korean Society for Philosophy of Science Annual Meeting, Gwacheon, South Korea, July 2026

“Identifying the quantum level structure of Er atoms on MgO using machine learning-assisted multiplet calculations”, KPS Spring Meeting, Daejeon, South Korea, April 2026 (Oral Presentation)

“Identifying the quantum level structure of Er atoms on MgO using machine learning-assisted multiplet calculations”, International Conference on Advanced Electromaterials (ICAE 2025), Jeju, South Korea, November 2025 (Poster session)

TECHNICAL SKILLS

Programming & Data Analysis:

MATLAB, LUA, IGOR Pro

Computational Physics:

Multiplet calculations (Quanty), Bayesian optimization

Outreach & Science Communication

- Ongoing Korean translation of David Albert’s “Time and Chance” – responsible for accurate rendering of physics and philosophy of physics terminology
- Created *STM Monopoly*, an educational game introducing scanning tunneling microscopy; featured at a MIT-Harvard open house event and presented at the Korean Society for Science Education meeting. The project served as the catalyst for *Science Arcade*, an ongoing game-based outreach program at the center
- Designed Schrödinger's Cat Party, an educational game introducing quantum mechanics concepts, to be released through *Science Arcade*
- Session Moderator, Women in Science (IBS Conference on STM '25): planned session format and prepared discussion questions for the panel

LANGUAGES

Korean: Native

English: Advanced