

Chanseung Lee

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- Education

Kyung Hee University, Republic of Korea

- B.S. in Applied Physics & Electronic Engineering 2023 – 2027 (expected)

- Research Interests

Developing semiconductor-based photonic integrated circuits for next-generation quantum computers.

- Silicon Photonics: Towards integrated optical computers with strain-engineered on-chip lasers
 - Quantum Photonics: Towards integrated quantum processors with strain-engineered 2D quantum devices

- Research Experience

Q-SPIN Laboratory (Quantum semiconductor Photonic Integrated Lab), KAIST

Advisor: Professor **Donguk Nam** Research Intern, Dec 2025 – Feb 2026

- Modeling strain-engineered optical & quantum behavior
 - Exploring integration strategies for on-chip optical quantum computing

- Projects

- Characterization and Parameter Extraction of Long- and Short-Channel MOSFETs [pdf]

Measured I-V characteristics using MS TECH probe station and CLARIUS software

Extracted Vt (ext/lin/sat), SS, Ioff, GIDL, DIBL, and gm

Analyzed long-channel vs short-channel behaviors and body-bias effects

Compared device scaling effects based on $L = 10 \mu\text{m}$ and $L = 0.35 \mu\text{m}$ transistors

- TCAD CMOS Process Simulation [pdf]

Built full NMOS process flow (oxidation → implantation → annealing → metallization)

Simulated ID-VG, ID-VD, Vth, gm, ro using Silvaco ATLAS, ATHENA

- Designing multistage Analog Amplifier using LTspice) [pdf]

Designed differential → gain → output stages - AC/DC/transient analysis and pole-zero extraction

- Single Photon Verification and Photon Statistics Analysis Using HBT, SPDC, and GRA Experiments
[pdf]

Measured normalized second-order correlation function $g^2(0)$ using HBT and GRA setups

Compared photon statistics of coherent, thermal, and SPDC-generated single-photon sources

Implemented SPDC photon pair generation using BBO crystal and verified photon-pair correlations

Demonstrated single-photon behavior through coincidence suppression ($g^2(0) \rightarrow 0$)

Analyzed effects of detector alignment, filtering, and classical vs quantum light sources

• **Skills**

- TCAD (ATHENA, ATLAS)
- LTspice (analog IC design)
- Semiconductor device physics, photonics, 2D materials
- Semiconductor Fabrication, MEMS