

MYEONGJIN SHIN

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EDUCATION

Korea Advanced Institute of Science and Technology (KAIST)

B.S. in Computing Science; double major in Mathematical Sciences; GPA: 4.0/4.3

Daejeon, Korea

Mar. 2021 – Aug. 2027

- KAIST enrollment period includes a two-year academic leave for mandatory military service in the Republic of Korea.

Gyeonggi Science High School for the Gifted

Computer Science

Suwon, Korea

Mar. 2018 – Feb. 2021

RESEARCH AND WORK EXPERIENCE

Caltech SURF Program

Undergraduate Research Fellow; advisor: Prof. Yu Tong, Prof. John Preskill

California, Caltech

May. 2026 – Present

- Research on emergent prethermal symmetries for scalable Hamiltonian learning.
- Research on certifying and learning Hamiltonians in the Heisenberg limit with single qubit gates and measurements.

KAIST Physics Quantum Information Theory Group

Undergraduate Research Assistant; advisor: Prof. Changhun Oh

Daejeon, Korea

Dec. 2025 – Present

- Research on Hamiltonian learning, bosonic and fermionic systems.

Research Institute of Mathematics, Seoul National University

Undergraduate Research Assistant; advisor: Dr. Kabgyun Jeong

Seoul, Korea

Feb. 2022 – Present

- Research on quantum entropies, variational quantum algorithms, quantum property testing, quantum singular value transformation.

KRAFTON

Research Internship

Seoul, Korea

Jul. 2023 – Aug. 2023

- Researched AI optimization methods and image processing.

PUBLICATIONS

* Equal contribution. $(\alpha-\beta)$ Alphabetical order, following theoretical computer science convention. [†] First author.

JOURNAL ARTICLES

- [6] **Heisenberg-limited Hamiltonian learning without short-time control**
Myeongjin Shin[†], Junseo Lee, Changhun Oh.
PRX Quantum (2026, accepted); **AQIS 2026 long talk.**
- [5] Bounding quantum uncommon information with quantum neural estimators
Donghwa Ji, Junseo Lee, **Myeongjin Shin**, IlKwon Sohn, Kabgyun Jeong.
Quantum Science and Technology 11(1), 015001 (2025).
- [4] Mutual information maximizing quantum generative adversarial networks
Mingyu Lee, **Myeongjin Shin**, Junseo Lee, Kabgyun Jeong.
Scientific Reports 15(1), 32835 (2025).
- [3] **Resource-efficient algorithm for estimating the trace of quantum state powers**
Myeongjin Shin*, Junseo Lee*, Seungwoo Lee, Kabgyun Jeong.
Quantum 9, 1832 (2025).
- [2] Disentangling quantum neural networks for unified estimation of quantum entropies and distance measures
Myeongjin Shin*, Seungwoo Lee*, Junseo Lee*, Mingyu Lee, Donghwa Ji, Hyeonjun Yeo, Kabgyun Jeong.
Physical Review A 110(6), 062418 (2024).
- [1] Estimating quantum mutual information through a quantum neural network
Myeongjin Shin[†], Junseo Lee, Kabgyun Jeong.
Quantum Information Processing 23(2), 1–16 (2024).

CONFERENCES

- [1] Certifying and learning local quantum Hamiltonians
Andreas Bluhm, Matthias C. Caro, Francisco Escudero Gutiérrez, Junseo Lee, Aadil Oufkir, Cambyse Rouzé, **Myeongjin Shin**^($\alpha-\beta$).
TQC 2026 contributed talk.
Note: This work subsumes a previous note, *Optimal certification of constant local Hamiltonians*, arXiv:2512.09778.

PREPRINTS

- [3] **Emergent Prethermal Symmetries for Scalable Hamiltonian Learning**
Myeongjin Shin[†], Junseo Lee, Iman Marvian, Yu Tong.
arXiv:2609.27181 (2026).
- [2] **Hamiltonian Learning and Certification via Eigenphase Engineering**
Myeongjin Shin[†], Yu Tong.
arXiv:2609.26596 (2026).
- [1] Near optimal quantum algorithm for estimating Shannon entropy
Myeongjin Shin[†], Kabgyun Jeong.
arXiv:2509.07452 (2025).

APPEARING SOON

- [1] Efficient Learning of Fermionic Magic States under Free-Fermion Evolution
Jiwon Heo*, **Myeongjin Shin***, Changhai Oh.

RESEARCH TALKS

Heisenberg-limited Hamiltonian learning without short-time control

- [Contributed] Asian quantum information science conference ([AQIS 2026](#))
- [Invited] TUHH group seminar
- [Invited] KAIST Physics QIT Lab Seminar

Aug. 2026
July. 2026
May. 2026

Certifying and learning local quantum Hamiltonians

- [Contributed] Theory of Quantum Computation, Communication and Cryptography Conference ([TQC 2026](#))
- [Invited] Quantum meets ([Youtube link](#))

Sep. 2026
June. 2026

Optimal certification of constant local Hamiltonians

- [Invited] University of Edinburgh Quantum Software Lab
- [Invited] KAIST Physics QIT Lab Seminar

Mar. 2026
Dec. 2025

Near optimal quantum algorithm for estimating Shannon entropy

- [Invited] Team QST Summer Workshop

Aug. 2025

Resource-efficient algorithm for estimating the trace of quantum state powers

- [Contributed] Annual Meeting of Korean Mathematical Society
- [Poster] Annual Conference on Quantum Information Processing (QIP 2025)

Oct. 2024
Feb. 2025

Disentanglement provides a unified estimation for quantum entropies and distance measures

- [Contributed] Korean Physical Society Spring Meeting
- [Poster] Annual Conference on Quantum Information Processing (QIP 2024)

Apr. 2024
Jan. 2024

Mutual information maximizing quantum generative adversarial networks

- [Invited] North Carolina State University Triangle Quantum Computing Seminar
- [Poster] Annual Conference on Quantum Information Processing (QIP 2024)

Nov. 2023
Jan. 2024

Estimating quantum mutual information through a quantum neural network

- [Invited] National Institute of Science Education and Research Bhubaneswar, India
- [Poster] Asian Quantum Information Science Conference (AQIS 2023)
- [Poster] Conference on the Theory of Quantum Computation (TQC 2023)

Aug. 2023
Aug. 2023
Jul. 2023

RESEARCH INTERESTS

- Quantum learning theory on bosonic and fermionic systems
- Quantum property testing
- Quantum entropies and distance measures
- Learning open quantum systems
- Quantum algorithms; QSVT, DQI, and Quantum oracle sketching
- Quantum error correction

TEACHING EXPERIENCE

Quantum Algorithms

Lectured on quantum decoded interferometry (DQI).

Winter 2025

Quantum Sensing and Hamiltonian Learning Study Group

Organized a study group on quantum computational sensing and Hamiltonian learning with real-time evolution.

Fall 2025

Quantum Learning and Complexity Theory

Lectured on random unitaries, classical shadows, quantum property testing, QSVT, and QAE.

Summer 2025

SELECTED HONORS AND AWARDS

KAIST Presidential Fellowship (KPF)	Mar. 2021 – Present
Caltech Summer Undergraduate Research Fellowship (Caltech SURF)	Jun. 2026 – Sep. 2026
KRAFTON AI Fellowship	Jul. 2023 – Aug. 2023
2024 Quantum Hackathon Korea – 1st place; Ministry of Science and ICT Prize	Jun. 2024
WorldQuant Brain Research Consultant	Sep. 2023
2023 Quantum Hackathon Korea – 3rd place; IonQ Special Prize	Jun. 2023
QHack Certificate of Achievement (Advanced)	Feb. 2023
Xanadu QHack Coding Challenges	Feb. 2023
Best Paper Award, Gyeonggi Science High School	Feb. 2021

PROFESSIONAL ACTIVITIES

Journal Reviewer
Quantum Information Processing; Quantum Machine Intelligence; npj Quantum Information

SKILLS AND QUALIFICATIONS

Programming C/C++, Python; Qiskit, PennyLane, PyTorch, TensorFlow, Java, JavaScript, Rust, React, Processing
Problem Solving Codeforces rating 1894 (Expert), max rating 1962 (Candidate Master): [godthinkun](#)
Languages Korean (native); English (fluent, TOEFL iBT 108); German and Spanish (basic)

Last updated: May, 2026