



Joonhee Choi

Assistant Professor of Electrical Engineering

CONTACT INFORMATION

- **Administrative Contact**

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Bio

BIO

Joonhee Choi is an Assistant Professor of Electrical Engineering at Stanford University. Joonhee received his Ph.D. and master's from Harvard University, as well as master's and bachelor's degrees from Korea Advanced Institute of Science & Technology. Prior to joining Stanford, he worked as an IQIM postdoctoral fellow at the Institute for Quantum Information and Matter (IQIM) at Caltech. Joonhee's research focus has been on engineering the dynamics of quantum many-body systems for both exploring fundamental science and demonstrating practical quantum applications. Throughout his career, he has worked in a wide variety of fields, including nonlinear nano-optics, ultrafast phenomena, solid-state and atomic physics, as well as quantum many-body physics. His expertise extends to practical applications in quantum metrology, communication, and information processing.

ACADEMIC APPOINTMENTS

- Assistant Professor, Electrical Engineering
- Member, Bio-X

HONORS AND AWARDS

- Terman Fellowship, Stanford University (2023)
- Outstanding Young Researcher Award, The Association of Korean Physicists in America (2021)
- IQIM Postdoctoral Fellowship, Caltech (2019-2022)
- Samsung Fellowship, Samsung (2013-2018)

PROGRAM AFFILIATIONS

- Stanford SystemX Alliance

PROFESSIONAL EDUCATION

- IQIM fellow, Caltech, Institute for Quantum Information and Matter
- PhD, Harvard University , Applied Physics
- AM, Harvard University , Physics
- BS/MS, KAIST , Mechanical Engineering

LINKS

- Group website: <https://choilab.stanford.edu/>
- Publications on Google Scholar: <https://scholar.google.com/citations?user=qy44cKQAAAAJ&hl=en>

Teaching

COURSES

2025-26

- Applied Quantum Mechanics I: EE 222, MATSCI 201 (Aut)
- Electromagnetic Waves: EE 242 (Win)
- Quantum Control and Engineering: EE 224 (Spr)

2024-25

- Applied Quantum Mechanics I: EE 222, MATSCI 201 (Aut)
- Quantum Control and Engineering: EE 224 (Spr)

2023-24

- Applied Quantum Mechanics I: EE 222, MATSCI 201 (Aut)
- Introduction to Photonics: EE 134 (Win)
- Quantum Control and Engineering: EE 224 (Spr)

2022-23

- Quantum Control and Engineering: EE 224 (Spr)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

David Atri Schuller, Mohammed Azzouz, Nahal Bagheri, Rachel Barcklay, Dominic Catanzaro, Tianxiang Dai, Yakub Grzesik, Niharika Gunturu, Chou-Wei Kiang, Heesoo Kim, Hannah Kleidermacher, Sydney Mason, Connie Miao, Erik Porter, Louise Schul, Michael Wahrman

Postdoctoral Faculty Sponsor

Shraddha Anand

Doctoral Dissertation Advisor (AC)

Timothy Chang, Nick Gharabaghi

Master's Program Advisor

David Concepcion, Jonah Ezekiel, Fyyaz Khan, Nils Kuhn, Cherie Kuo, Evelyn Nutt

Doctoral (Program)

Timothy Chang, Chou-Wei Kiang, Yang Xu

Publications

PUBLICATIONS

- **Erasure cooling, control, and hyperentanglement of motion in optical tweezers.** *Science (New York, N.Y.)*
Shaw, A. L., Scholl, P., Finkelstein, R., Tsai, R. B., Choi, J., Endres, M.
2025; 388 (6749): 845-849

- **Maximum Entropy Principle in Deep Thermalization and in Hilbert-Space Ergodicity** *PHYSICAL REVIEW X*
Mark, D. K., Surace, F., Elben, A., Shaw, A. L., Choi, J., Refael, G., Endres, M., Choi, S.
2024; 14 (4)
- **Single-Shot Readout and Weak Measurement of a Tin-Vacancy Qubit in Diamond** *PHYSICAL REVIEW X*
Rosenthal, E. I., Biswas, S., Scuri, G., Lee, H., Stein, A. J., Kleidermacher, H. C., Grzesik, J., Rugar, A. E., Aghaieimeibodi, S., Riedel, D., Titze, M., Bielejec, E. S., Choi, et al
2024; 14 (4)
- **Universal quantum operations and ancilla-based read-out for tweezer clocks.** *Nature*
Finkelstein, R., Tsai, R. B., Sun, X., Scholl, P., Direkci, S., Gefen, T., Choi, J., Shaw, A. L., Endres, M.
2024; 634 (8033): 321-327
- **Benchmarking highly entangled states on a 60-atom analogue quantum simulator.** *Nature*
Shaw, A. L., Chen, Z., Choi, J., Mark, D. K., Scholl, P., Finkelstein, R., Elben, A., Choi, S., Endres, M.
2024
- **An elementary review on basic principles and developments of qubits for quantum computing.** *Nano convergence*
Chae, E., Choi, J., Kim, J.
2024; 11 (1): 11
- **Multi-ensemble metrology by programming local rotations with atom movements** *NATURE PHYSICS*
Shaw, A. L., Finkelstein, R., Tsai, R., Scholl, P., Yoon, T., Choi, J., Endres, M.
2024
- **Erasure conversion in a high-fidelity Rydberg quantum simulator.** *Nature*
Scholl, P., Shaw, A. L., Tsai, R. B., Finkelstein, R., Choi, J., Endres, M.
2023; 622 (7982): 273-278
- **Many-body cavity quantum electrodynamics with driven inhomogeneous emitters.** *Nature*
Lei, M., Fukumori, R., Rochman, J., Zhu, B., Endres, M., Choi, J., Faraon, A.
2023