

TONGYU ZHAO

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EDUCATION

University of Colorado Boulder

Doctor of Philosophy in Physics

Boulder, Colorado

Aug 2018 – Present

Nanjing University

Bachelor of Science in Physics

Nanjing, China

Aug 2014 – Jun 2018

- **Honors:** Elite Program
- **Thesis:** Stimulated Emission Tomography of Entangled Photon Pairs

RESEARCH EXPERIENCE

National Institute of Standards and Technology

Research Assistant

Boulder, Colorado

Jul 2021 – Present

- Advisor: Dr. Raymond Simmonds
- Develop quantum measurement programs.
- Investigate novel superconducting qubit architecture.
- Investigate quantum error correction with dual-rail encoding.
- Design quantum simulation experiments for small molecular systems.

Research Assistant

Mar 2019 – Jul 2021

- Advisor: Dr. David Pappas
- Build quantum measurement systems.
- Design superconducting quantum processors.
- Design quantum simulation experiments for small molecular systems.

Nanjing University

Undergraduate Research Assistant

Nanjing, Jiangsu, China

Sep 2017 – Jun 2018

- Advisor: Dr. Xiaosong Ma
- Build optics system for SET (Stimulated Emission Tomography) experiment.
- Build polarization analyzing systems.
- Theoretical work for clock synchronization with entangling photons.

University of California Berkeley

Summer Intern

Berkeley, California

May 2017 – Sep 2017

- Advisor: Dr. Dan Stamper-Kurn
- Build an optical transport system for a magneto-optical trap.
- Develop programs to characterize the performance of the transport system.

SKILLS

- **Programming:** Python, Julia, MATLAB
- **Tools:** Ansys EM, COMSOL Multiphysics, LabVIEW, Sonnet
- **Lab Skills:** Cryogenics, Measurement Electronics and Automation

PUBLICATIONS

- Bal, Mustafa, Junling Long, Ruichen Zhao, Haozhi Wang, Sungoh Park, Corey Rae Harrington McRae, **TZ**, et al. “Overlap Junctions for Superconducting Quantum Electronics and Amplifiers”. *Applied Physics Letters* 118, no. 11 (March 2021): 112601. <https://doi.org/10.1063/5.0048621>
- Goswami, A., A. P. McFadden, **TZ**, H. Inbar, J. T. Dong, R. Zhao, C. R. H. McRae, R. W. Simmonds, C. J. Palmstrøm, and D. P. Pappas. “Towards Merged-Element Transmons Using Silicon Fins: The FinMET”. *Applied Physics Letters* 121, no. 6 (August 2022): 64001. <https://doi.org/10.1063/5.0104950>
- Howard, Joel, Alexander Lidiak, Casey Jameson, Bora Basyildiz, Kyle Clark, **TZ**, Mustafa Bal, et al. “Implementing Two-Qubit Gates at the Quantum Speed Limit”. *Physical Review Research* 5, no. 4 (December 2023): 43194. <https://doi.org/10.1103/PhysRevResearch.5.043194>
- Long, Junling, **TZ**, Mustafa Bal, Ruichen Zhao, George S. Barron, Hsiang-sheng Ku, Joel A. Howard, et al. “A Universal Quantum Gate Set for Transmon Qubits with Strong ZZ Interactions”. arXiv, March 2021. <https://doi.org/10.48550/arXiv.2103.12305>
- McRae, C. R. H., A. McFadden, R. Zhao, H. Wang, J. L. Long, **TZ**, S. Park, M. Bal, C. J. Palmstrøm, and D. P. Pappas. “Cryogenic Microwave Loss in Epitaxial Al/GaAs/Al Trilayers for Superconducting Circuits”. *Journal of Applied Physics* 129, no. 2 (January 2021): 25109. <https://doi.org/10.1063/5.0029855>
- Zhao, R., S. Park, **TZ**, M. Bal, C.R.H. McRae, J. Long, and D.P. Pappas. “Merged-Element Transmon”. *Physical Review Applied* 14, no. 6 (December 2020): 64006. <https://doi.org/10.1103/PhysRevApplied.14.064006>