

Chunyang Ding

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RESEARCH AND WORK EXPERIENCE

Stanford University, Physics Dept., Applied Physics Dept., and the Ginzton Lab

Stanford, CA

Graduate Student Researcher

6/2023-present

- Continued investigation on single and coupled heavy fluxonium qubits, probing new readout schemes with Prof. **David I. Schuster**, Prof. **Jens Koch**, and Prof. **Alexandre Blais**.
- Assembled, organized, and set up 7 dilution refrigerators in a new lab space. Serving as safety officer, coordinating with Stanford administration.

University of Chicago, Physics Department and the James Franck Institute

Chicago, IL

Graduate Student Researcher

7/2020 – 6/2023

- Executed and optimized two-qubit entangling gates on inductively coupled heavy fluxonium experiment with Prof. **David I. Schuster** and Prof. **Jens Koch**.
- Designed and construction of measurement chain using room temperature rfSOC control platform, in collaboration with Dr. **Gustavo Cancelo** (Fermilab)
- Simulation and design of new CPW two-qubit fluxonium sample for future experiments with **Helin Zhang**
- Advised undergraduate research students in optimizing and minimizing flux crosstalk in qubit chips

IonQ

College Park, MD

Associate Physicist

6/2019 – 7/2020

- Analyzed optomechanical design for next-generation trapped-ion quantum computer with Dr. **David Wong-Campos** to reduce noise instability and increase functional operation of the system.
- Ordering, testing, and assembling 200+ optomechanical components for the implementation of the new Ytterbium quantum computer in a team of seven people, led by Dr. **Kai Hudek**

Yale University, Applied Physics Department

New Haven, CT

Student Researcher

1/2018 – 5/2019

- Designed and prototyped modular broadband microwave cavity attenuator design for noise reduction in superconducting quantum computing systems with **Zhixing Wang** and Professor **Michel Devoret**
- Design of electronic systems for testing of shot noise thermometers on parametric amplifiers

Yale University, Physics Department

New Haven, CT

Student Researcher

5/2017 – 1/2018

- Designed, built, and tested optical lens systems using OSLO for imaging trapped ultra-cold potassium atoms in a magneto-optical trap with Professor **Nir Navon**
- Designed, prototyped, and fabricated 400 Gauss Feshbach magnetic coils and additional support systems.

EDUCATION

Ph.D candidate in Physics from **Stanford U.** | Began in June 2023

Stanford, CA

M.S. in Physics from **U. of Chicago** | GPA (3.82/4.00) | Received in June 2022

Chicago, IL

Bachelor of Science in Physics (Intensive) from **Yale U.** | GPA (3.79/4.00) | Class of 2019

New Haven, CT

Fellow at **U. Waterloo** Undergraduate School in Experimental Quantum Information Processing, 2018

Waterloo, ON

Valedictorian of **Interlake High School**, Class of 2015 | GPA (4.00/4.00) | IB Diploma, 16 AP exams

Bellevue, WA

Publications and Presentations

- Zhang, H*, Ding, C*, ... Schuster, D. I. **Tunable inductive coupler for high fidelity gates between fluxonium qubits** *PRX Quantum* **5** 020426 (2024) (*Featured Cover Article*)
- Ding, C., Zhang, H., ... Schuster, D. I. **ibid. circuitQED@20** Yale Quantum Institute 2024, New Haven, CT, Poster Session
- Ding, C., Di Federico, Martin, ... and Cancelo, Gustavo. **Experimental advances with the QICK (Quantum Instrumentation Control Kit) for superconducting quantum hardware** *Phys. Rev. Research* **6** 013305 (2024)
- Ding, C. Zhang, H., ..., Koch, J., and Schuster, D. I. **Reconsidering qubit control paradigms for high fidelity fluxonium gates** *International workshop on the physics of disordered superconductors and their application to quantum circuits* QuanDi 2023, Les Houches, France, Invited Talk
- Weiss, D. K., Zhang, H., Ding, C., Ma, Y., Schuster, D. I., Koch, Jens. **Fast high-fidelity gates for galvanically-coupled fluxonium qubits using strong flux modulation** *PRX Quantum* **93** (4) 044709 (2022)
- Ding, C., Zhang, H., ... Schuster, D. I. **Improved readout with active reset in a heavy fluxonium circuit** *Bulletin of the American Physical Society* March Meeting, 2022

- Stefanazzi, L., Treptow, K., ... Zhang, H., Ding, C., and Schuster, D. I. **The QICK (Quantum Instrumentation Control Kit): Readout and control for qubits and detectors.** *Rev. Sci. Inst.* **93** 044709 (2022)

Awards

- Received Yale Rosenfeld Science Scholar Fellowship and Saybrook Research Fellowship 2018
- 3rd place award at Yale Undergraduate Research Symposium, out of 40 participants 2018
- Received Tsai City Innovation Award as co-founder of LitKit, a fluorescent microscope device 2018
- Recipient of Society of Physics Students Reporter Award for 2016 PhysCon S.F. 2016

Activities

- Member of the Committee for a Better Environment for the City of College Park 2019 – 2020
- Chair of Dean's STEM Advisory Committee on Science and Quantitative Reasoning 2017 – 2019
- Member of the National Public Radio's Scicomm program 2016 – 2021
- Editor-in-Chief of the Yale Scientific Magazine 2016 – 2018

Special Skills and Interests

- Microwave engineering test equipment expertise (oscilloscope, AWGs, network analyzers) and in designing signal processing chains (YIG filters, quantum limited amplifiers, rfSOC FPGA, low noise DC sources)
- Trained and proficient in cleanroom fabrication techniques for superconducting circuits, including optical and ebeam lithography, Plassys thin-film deposition, reactive ion etching, strong acid etching
- Simulation software expertise including HFSS, Microwave Office, Zemax, OSLO, Onshape, AutoCAD, OMAX Make/Layout
- Machine shop training for wood, plastic, and metal, including using drills, lathes, laser cutters, and waterjet cutters
- Operation and maintenance of cryogenic dilution refrigerators (Bluefors, Oxford), including pump replacement
- Fluent in Python, Matlab, Mathematica languages for data analysis and visualization, with `scqubits` and `qutip` packages
- Strong scientific communication skills; author of fourteen articles in the *Yale Scientific Magazine*, published in *Physics Today* and in *Physics World*

References

Dr. David Schuster, Professor of Physics at UChicago
 Dr. Michel Devoret, Professor of Physics at UCSB

Dr. David Wong-Campos, Postdoctorate Fellow at Harvard
 Dr. Jens Koch, Professor of Physics at Northwestern