Sara Sussman

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Education

2018-present	**Ph.D, Physics,** Princeton University.
2018	**B.A.** Summa Cum Laude, **Physics,** Boston University.

Selected Publications

See all on Google Scholar here

2021

The QICK (Quantum Instrumentation Control Kit): Readout and control for qubits and detectors
L. Stefanazzi, ..., S. Sussman, et al.
arXiv, 2110.00557

New material platform for superconducting transmon qubits with coherence times exceeding 0.3 milliseconds
A. P. M. Place, L. V. H. Rodgers, ..., S. Sussman, et al.
Nat Commun **12**, 1779 (2021)

2018

Dinucleon and Nucleon Decay to Two-Body Final States with no Hadrons in Super-Kamiokande
Super-Kamiokande Collaboration: S. Sussman, et al.
arXiv, 1811.12430

Experience

Professional

2019-present	**Graduate Researcher,** Princeton University. Work on the design, fabrication and control of superconducting qubits under the supervision of Andrew Houck.
2019-2020	**Lab Instructor and Teaching Assistant,** Princeton University.
2016-2018	**Undergraduate Researcher,** Boston University. Worked on prototyping FPGA-based front-end electronics and upgrading the high voltage system of the Super-Kamiokande neutrino detector under the supervision of Ed Kearns.
2016	**Undergraduate Researcher,** Harvard University. Created a website and algorithms for ATLAS collaborators to find potentially malfunctioning hardware in the muon spectrometer under the supervision of Melissa Franklin.

Miscellaneous

2018-present	**Organizer,** Princeton Women in Physics, Princeton University.

Awards

2019-2020	Physics Department Teaching Award, Princeton University
2020	National Defense Science and Engineering Graduate Fellowship, Department of Defense
2020	Graduate Research Fellowship, National Science Foundation (Declined)
2018-2019	Van Zandt Williams, Sr., *41 Fellowship, Princeton University
2018	Joseph Henry Merit Prize, Princeton University
2018	College Prize in Physics, Boston University

Presentations

2021 Oct	**Talk,** *Scalable qubit control with a fast perfect entangler* EPiQC monthly talk
2021 Mar	**Talk,** *FPGA-based optimal control for two-qubit gates* APS March Meeting
2021 Jan	**Journal Club,** *Superconducting qubits made of tantalum* ASU/JPL/MIT Quantum Journal Club

2020 Nov   **Talk,** *FPGA-based control of a high-coherence superconducting qubit*
            Arizona State University Engineering Coffee Hour

Skills

Hardware: RF data acquisition and timing systems, digital and analog circuits, high voltage systems.

Programming: Python, C/C++, Verilog, VHDL, Mathematica, MATLAB.

Software: Xilinx Vivado Design Suite, ExpressPCB, Intel Quartus Prime.

Microfab: Photolithography (photomask and direct write), wet/dry etching, metal deposition, surface metrology (profilometer), imaging (x-ray photoelectron spectroscopy, scanning electron microscopy).

Courses Taught

2020 Spring   Princeton PHY 109: Mechanics and Electromagnetism - TA

2019 Fall   Princeton ELE 308: Electronic and Photonic Devices - TA

2019 Summer Princeton EGR 150: Foundations of Engineering - Lab Instructor (link)

Student Projects Mentored

2021 Summer Inci Karaaslan, "Cross-Entropy-Style Benchmarking of a 13 ns Perfect Entangler"

2020 Spring   Connie Miao, "Developing A Serial Port FIFO on an iCE40 FPGA to Prototype Superconducting Qubit Control Feedback Loops"

2019 Summer Petru Cotrut, "FPGA-based Hardware Averaging and Active Reset with the Keysight M9010A PXI Chassis"