Sara Sussman

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Education

2018-present **Ph.D, Physics,** Princeton University.

2018 **B.A.** Summa Cum Laude, **Physics,** Boston University.

Publications

2020

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.
arXiv, 2003.00024

2019

Sensitivity of Super-Kamiokande with Gadolinium to Low Energy Anti-neutrinos from Pre-supernova Emission
Super-Kamiokande Collaboration: C. Simpson, ..., S. Sussman, et al.
The Astrophysical Journal, Volume 885, Number 2

Measurement of neutrino-oxygen neutral-current quasi-elastic cross section using atmospheric neutrinos at Super-Kamiokande
Super-Kamiokande Collaboration: L. Wan, ..., S. Sussman, et al.
Phys. Rev. D 99, 032005

Atmospheric Neutrino Oscillation Analysis With Improved Event Reconstruction in Super-Kamiokande IV
Super-Kamiokande Collaboration: M. Jiang, ..., S. Sussman, et al.
Progress of Theoretical and Experimental Physics, Volume 2019, Issue 5.

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 fabrication and control of superconducting qubits under the supervision of Andrew Houck, specializing in FPGA/SoC-based control.

2019-present **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

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

2017 3rd Prize at the International Neutrino Summer School Poster Competition, Fermilab

2017 2nd Prize at the International Neutrino Summer School Oral Presentations, Fermilab

Presentations

2019 Nov **Talk,** *Towards FPGA-based Optimal Control of Superconducting Qubits*
Princeton Physics Ph.D. Experimental Project Seminar, Princeton, New Jersey.

2018 Apr **Talk,** *Dinucleon and Nucleon Decay into Two-Body Final States with No Hadrons*
APS April Meeting, Columbus, Ohio.

2017 Oct **Talk,** *Prototype Front-End Electronics for Hyper-Kamiokande QTC-TDC Board*
BU Advanced Lab Seminar, Boston, Massachusetts.

2017 Aug **Poster,** *Multi-GeV Multi-Ring Event Reconstruction in Super-Kamiokande*
International Neutrino Summer School at Fermilab, Batavia, Illinois.

2017 Aug **Talk,** *Side By Side By Side: ν Event Simulation in Super-K, NOvA and ArgoNeuT*
International Neutrino Summer School at Fermilab, Batavia, Illinois.

Skills

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

Programming: C/C++, Python, 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

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"