

# Sara Sussman

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## Education

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

## Selected Publications

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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

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### 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.

### Awards

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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

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2022 Aug **Talk, TBD**  
2022 Joint Review Meeting for the AFOSR QIS & AMP groups

2022 Apr **Talk, TBD**  
Princeton Undergraduate Talk Series

2022 Mar **Talk, The QICK (Quantum Instrumentation Control Kit)**  
APS March Meeting

2021 Nov **Talk, The QICK (Quantum Instrumentation Control Kit)**  
QMat Cafe | Academic and Industry, University of Strasbourg

2021 Nov **Talk, Scalable qubit control with a fast perfect entangler**

	ASU QuEST talk
2021 Oct	<b>Talk</b> , <i>Scalable qubit control with a fast perfect entangler</i> EPiQC monthly talk
2021 Mar	<b>Talk</b> , <i>FPGA-based optimal control for two-qubit gates</i> APS March Meeting
2021 Jan	<b>Journal Club</b> , <i>Superconducting qubits made of tantalum</i> ASU/JPL/MIT Quantum Journal Club
2020 Nov	<b>Talk</b> , <i>FPGA-based control of a high-coherence superconducting qubit</i> ASU Engineering Coffee Hour

## Skills

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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

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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 ( <a href="#">link</a> )

## Student Projects Mentored

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2021-2022	Hoang Le, "Towards a 2D Superconducting Kerr-cat Qubit"
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"

## Academic Service

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2022	Session Chair, APS March Meeting.
2021-present	Reviewer, Review of Scientific Instruments.
2018-present	Organizer, <a href="#">Princeton Women in Physics</a> , Princeton University.