

# 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.

## Publications

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2019

*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

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### 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

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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

2017, 2018 Undergraduate Research Opportunities Program Fellowship, Boston University

## Presentations

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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:  $\nu$  Event Simulation in Super-K, NOvA and ArgoNeuT*  
International Neutrino Summer School at Fermilab, Batavia, Illinois.

## Skills

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- 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

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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 ([link](#))

## Volunteer Work

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- 2018-2019     Undergraduate Women in Physics Mentorship Program, Princeton University