Sara Sussman

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Education

Princeton University, Physics Ph.D. Candidate *9/2018-*

Boston University, Physics B.A. Summa Cum Laude *5/2018*

Publications

View all on arXiv

Research Experience

Graduate Researcher, Prof. Houck Group, Princeton University *2/2019-*

Process Development for Superconducting Qubit Fabrication
Studying adhesion and intermediate cleaning methods.

FPGA-based Controls for Superconducting Qubits
Implementing on-chip computation and feedback into the lab's qubit measurement routines.

Undergraduate Researcher, Prof. Kearns Group, Boston University *9/2016 - 9/2018*
Super-Kamiokande (SK) and Hyper-Kamiokande (HK) Collaborations

Senior Research Project: Dinucleon and Nucleon Decay into Two-Body Final States with No Hadrons
Searched for 10 dinucleon and nucleon decay modes using the entire SK dataset.

SK Event Reconstruction Software Developer: APFIT
Located and solved a set of Cherenkov-ring-counting issues.

HK Front-end Electronics Developer: Prototype QTC-TDC Board
Wrote DAQ software, tested QTC/TDC performance, FPGA programming to improve performance.

SK Outer Detector High Voltage Expert
Developed remote control software for new HV crates, integrated and installed new crates in SK.

Undergraduate Researcher, Prof. Franklin Group, Harvard University *12/2015 - 9/2016*
ATLAS Collaboration

Website: Find Problematic Muon Spectrometer Detector Elements: http://cern.ch/muons/
Users upload eta-phi histograms and learn which elements overlay spatial coordinates in question.

DAQ Software for Prototype Micromegas Apparatus
Wrote and tested geometry and track reconstruction library for ATLAS muon upgrade prototype.

Awards

Van Zandt Williams, Sr., *41 Fellowship, Princeton University *2018-2019*
Joseph Henry Merit Prize, Princeton University *2018*
College Prize in Physics, Boston University *2018*
International Neutrino Summer School (INSS), Poster Competition, 3rd Prize *Fermilab, 8/2017*
INSS Group Tutorial, Oral Presentation Competition, 2nd Prize *Fermilab, 8/2017*

Recent Presentations

Towards FPGA-based Optimal Control of Superconducting Qubits *Physics Ph.D. Experimental Project*
Princeton NJ, 11/6/19

Dinucleon and Nucleon Decay into Two-Body Final States with No Hadrons *APS April Meeting*
Columbus OH, 4/14/18

Prototype Front-End Electronics for Hyper-Kamiokande QTC-TDC Board *BU Advanced Lab Seminar*
Boston MA, 10/15/2017

Multi-GeV Multi-Ring Event Reconstruction in Super-Kamiokande (Poster) *INSS, Fermilab*
Batavia IL, 8/17/2017

Graduate Coursework

Physics: Quantum Information; Advanced Particle Physics I; Introduction to Particle Physics; Cosmology

Engineering/Design: Electronics for Scientists; Advanced Laboratory

Math: Mathematical Physics

Teaching/Mentoring

Teaching Assistant, Physics Methods and Applications (PHY 109) *Princeton Physics Dept.*
Teaching mechanics and electromagnetism working under Dr. Katerina Visnjic. *Princeton NJ, 2020*

Teaching Assistant, Electronic and Photonic Devices (ELE 308) *Princeton Electrical Engineering Dept.*
Led silicon microfabrication labs working under Prof. Nathalie de Leon. *Princeton NJ, 2019*

Lab Instructor, Foundations of Engineering (EGR 150) *Princeton Freshman Scholars Institute*
Developed accelerometer-based labs working under Prof. Claire Gmachl (link to gallery). *Princeton NJ, 2019*

Mentor, Undergraduate Women in Physics Mentorship Program *Princeton Physics Dept.*
Academic/research mentor to several female physics undergraduates. *Princeton NJ, 2018-*

Leadership

Organizer, Princeton Women in Physics *Princeton NJ, 2018-*
Plan events that promote diversity and outreach, fundraised to include women from the Astrophysics and Plasma Physics departments. Maintain group website (link to site).

Workshops/Trainings Attended

"The Lab, Reimagined" Workshop *McGraw Center for Teaching and Learning*
"How can I make my lab more applied or relevant?" *Princeton NJ, 1/23/20*

Princeton Distress Awareness & Response (PDAR) Training *Graduate Mental Health Initiative*
"How can I recognize & respond to students in distress?" *Princeton NJ, 11/15/19*

Skills

Programming: C/C++, Python, FORTRAN, ROOT, Mathematica, MATLAB, Verilog, VHDL, JavaScript, HTML/CSS

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

Hardware: Data acquisition and timing systems, digital and analog circuits, high voltage systems, Cherenkov detectors, gaseous ionization detectors

Microfabrication: Photolithography (photomask and direct write), wet/dry etching, ashing, metal deposition, surface metrology (profilometer), packaging (dicing and wire bonding), imaging (x-ray photoelectron spectroscopy, scanning electron microscopy)