

# SARA SUSSMAN

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## EDUCATION

**Princeton University**, Physics Ph.D. Candidate

*September 2018-*

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

*May 2018*

## PUBLICATIONS

View all on [arXiv](#)

## RESEARCH EXPERIENCE

**Undergraduate Researcher, Prof. Kearns Group, Boston University**

*9/2016 - present*

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

**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*

**Undergraduate Research Opportunities Program Fellowship**, Boston University

*2017, 2018*

## RECENT PRESENTATIONS

**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*

**Side By Side By Side:  $\nu$  Event Simulation in Super-K, NOvA and ArgoNeuT**

*INSS, Fermilab  
Batavia IL, 8/17/2017*

## GRADUATE COURSES COMPLETED

**Physics:** Advanced Particle Physics I; Introduction to Particle Physics; Cosmology

**Engineering/Design:** Electronics for Scientists; Advanced Laboratory

**Math:** Mathematical Physics

## TEACHING/MENTORING EXPERIENCE

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### **Mentor, Undergraduate Women in Physics Mentorship Program**

Academic/research mentor to several female physics undergraduates.

*Princeton Physics Dept.*

*Princeton NJ, 2018-*

### **Research Mentor (Hardware)**

Mentored high school summer intern at Fermilab with Dr. Jin-Yuan Wu.

*Fermilab*

*Batavia IL, 8/2017*

### **Student-Teacher and Volunteer**

Taught high school juniors and seniors calculus and precalculus.

*Charlestown High School*

*Boston MA, 2015*

### **Corps Member**

Tutored and mentored K-8 students in math in a bilingual Dorchester school.

*City Year Boston*

*Boston MA, 2013-2014*

## LEADERSHIP

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### **Organizer, Princeton Women in Physics**

*Princeton NJ, 2018-*

Plan events that promote diversity and outreach in the Princeton physics department. Fundraised to include graduate/postgraduate women from the Astrophysics and Plasma Physics departments.

### **Director, Junction**

*MIT, Cambridge MA, 2015*

Redesigned summer program where 41 high school students do independent research with 1:1 mentoring. See more at [this link](#).

### **Director, Spring High School Studies Program (HSSP)**

*MIT, Cambridge MA, 2015*

Led six week Saturday program where 500 high school students take courses taught by undergraduates.

### **Director, The Checkmate Club**

*Dorchester MA, 2013-2014*

Created a weekly math, logic and chess program for local teenagers.

## SKILLS

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

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

**Hardware:** Cherenkov detectors, high voltage systems, gaseous ionization detectors, data acquisition and timing systems, digital and analog circuits, lab equipment such as NIM modules, multichannel analyzers and oscilloscopes, basic machining with mills and laser cutters (plastic and steel)