

Jay Aronow Frothingham

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EDUCATION

B.A. Engineering and Astronomy, 3.92 GPA

Smith College, Northampton MA, May 2023

EMPLOYMENT

Scientific Data Analyst, Green Bank Observatory

Green Bank WV

May 2023 - Present

Student Researcher, Smith College Physics Department

Northampton MA

September 2019 - September 2021

Hardware Engineering Intern, HP, Inc.

Corvallis OR

Summer 2019

Electrical Engineering Intern, HP, Inc.

Corvallis OR

Summer 2018

RESEARCH

Microwave Photonic Synthesizer Characterization for Applications in Radio Astronomy Instrumentation

National Radio Astronomy Observatory (NRAO) Research Experience for Undergraduates

Tested and characterized laser source for potential use as ngVLA (next-generation Very Large Array) local oscillator. Presented findings to external engineering representatives and NRAO mentors.

Research Mentor: William Shillue

[*Supporting materials available*](#)

A Circuit Board Printer for Muon Detector Construction and Classroom Use

Summer Undergraduate Research Fellowship, Smith College Dept. of Physics

Tested feasibility of a circuit board printer to manufacture components quickly and reliably. Assembled and tested muon detectors to assess quality of reflow soldering techniques. Designed and built an adjustable

camera mount to improve equipment accessibility. Wrote documentation and user guide to circuit board printer. Presented results to Smith College Physics and Astronomy departments.

Research Advisor: Dr. Nathanael Fortune

Portable Muon Detectors for Tests of Time Dilation

STudent Research In DEpartments (STRIDE), Smith College Dept. of Physics

Used custom-built portable muon detectors to collect data at different elevations. Worked with peers to analyze data collected in various locations. Managed project milestones and scheduled lab meetings during periods of remote work. Presented results to Smith College Physics and Astronomy departments.

Research Advisor: Dr. Nathanael Fortune

A Python Package for Correction of Magnetic Field Dependence of Resistive Thermometers

Summer Undergraduate Research Fellowship, Smith College Dept. of Physics

Optimized Python code characterizing resistive thermometers' response to magnetic fields. Removed code redundancies by bundling custom functions into a package and defining a class. Automated essential functions and increased user control over other functions. Managed revisions through Gitlab. Wrote detailed documentation in Markdown and Python. Code used in analysis for published paper.

Research Advisor: Dr. Nathanael Fortune

Experimental Measurements of Phase Transitions in Superconductors Under Extreme Conditions

STudent Research In DEpartments (STRIDE), Smith College Dept. of Physics

Designed and fabricated custom lab equipment in a machine shop. Performed soldering under a microscope. Evaluated and modified test probe electronics and wiring.

Research Advisor: Dr. Nathanael Fortune

Using Arduino to Teach Mechatronics

Apprenticeships in Science and Engineering, Oregon State University, Corvallis OR

research description [here](#)

Research Advisor: Dr. Burak Sencer

PUBLICATIONS

LaBarre, P.G., Rydh, A., Palmer-Fortune, J., **Frothingham, J.A.**, Hannahs, S.T., Ramirez, A.P., Fortune, N.A. "Magnetoquantum oscillations in the specific heat of a topological Kondo insulator." *Journal of Physics: Condensed Matter* (2022).