

# CARRIE DAVIS

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(973) 580-5203

## EDUCATION

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**UNIVERSITY OF PENNSYLVANIA** Philadelphia, PA  
Doctor of Philosophy in Physics June 2022 – Present  
Master of Science in Physics May 2024  
Advisor: Christopher Mauger

**UNIVERSITY OF NOTRE DAME** Notre Dame, IN  
Bachelor of Science in Physics & English May 2022  
Glynn Family Honors Program, Advanced Physics Concentration  
Thesis topic: Commissioning of the St. Benedict Radiofrequency Carpet  
Advisor: Maxime Brodeur

## HONORS & AWARDS

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Outstanding Undergraduate Research Award 2022  
BASF Scholarship (BASF Corporation) 2018 – 2022  
Girl Scout Gold Award (GSNNJ) 2018  
Young Woman in Public Affairs Award (Zonta Club of Morristown) 2018

## RESEARCH EXPERIENCE

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**HIGH ENERGY PHYSICS EXPERIMENTAL GROUP** Philadelphia, PA  
*Graduate Research Assistant* June 2022 – Present

- Assist in hardware development and testing for the T2K near detector upgrade
- Develop firmware for SuperFGD optical concentrator boards

**NUCLEAR SCIENCE LABORATORY** Notre Dame, IN  
*Physics Research Assistant* February 2020 – May 2022

- Performed pressure calculations for the differential pumping regions of St. Benedict
- Simulated ion flow and transport along a RF carpet using SIMION ion and electron optics simulator
- Analyzed efficiency and beam characteristics to evaluate optimal frequency and bias settings of experimental RF carpet setup

**LABORATORY FOR RESEARCH ON THE STRUCTURE OF MATTER** Remote  
*REU Participant* June 2021 – August 2021

- Mathematically modeled how defect size in nematic liquid crystal droplets changes as a function of external magnetic field strength
- Employed a Jones Matrix analysis to create simulated droplet images using Python

**CORONANET RESEARCH GROUP** Remote  
*Research Assistant* June 2020 – August 2020

- Conducted internet-based research on Mexican subnational policies in response to COVID-19 and documented policies using Qualtrics software

**NOTRE DAME INSTITUTE FOR ADVANCED STUDY** Notre Dame, IN  
*Student Research Assistant* August 2019 – May 2020

- Compared undergraduate involvement in research, faculty fellows, and projects at peer institutes to work done at Notre Dame
- Prepared a bibliography on “trust” across multiple disciplines for undergraduate researchers to reference in their interdisciplinary work with faculty fellows
- Compiled and managed database information utilized in marketing and outreach efforts

**NOTRE DAME INSTITUTE FOR ADVANCED STUDY** Notre Dame, IN  
*Undergraduate Research Assistant* January 2019 – May 2019

- Analyzed the writings of E.T. Jaynes to understand the role of probability in thermodynamics
- Discussed research methods in the sciences and humanities, presented progress in weekly seminars

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## FUNDING

University of Notre Dame; Notre Dame, IN  
Glynn Family Honors Program  
Maxime Brodeur  
Funding for January 2021: \$870

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## RESEARCH INTERESTS

Experimental nuclear physics  
Fundamental symmetries  
Physics beyond the Standard Model  
Precision measurements  
Electroweak interactions

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## PROFESSIONAL EXPERIENCE

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### GIRL SCOUTS OF NORTHERN NEW JERSEY

Kinnelon, NJ

*Trading Post Manager, Lake Rickabear Day Camp*

June 2019 – August 2019

- Operated the camp store, including selling, maintaining accurate accounting, monitoring inventory, ordering snacks, and packing overnight care packages
- Assisted in camp office and as a counselor as needed

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## TECHNICAL SKILLS

Mathematica	Python
Lua	C
SIMION Ion and Electron Optics Simulator	Verilog/VHDL

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## PUBLICATIONS

C. Davis, R. Bualuan, O. Bruce, D.P. Burdette, A. Cannon, T. Florenzo, D. Gan, J. Harkin, B. Liu, J. Long, P.D. O'Malley, W.S. Porter, F. Rivero, M.A. Yeck, R. Zite, M. Brodeur, "Commissioning of the St. Benedict RF carpet." *Nuclear Inst. and Methods in Physics Research, A*, 1042 (2022) 167422.  
C. Davis, O. Bruce, D. P. Burdette, T. Florenzo, B. Liu, J. Long, P. D. O'Malley, M. A. Yeck, M. Brodeur, "Transport tests of the St. Benedict first-stage extraction system." *Nuclear Inst. and Methods in Physics Research, A*, 1031 (2022) 166509.

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## PRESENTATIONS

Commissioning of the St. Benedict Radiofrequency Carpet, College of Science Joint Annual Meeting 2022  
Formation of Slow Radioactive Ion Beams for St. Benedict, Glynn Family Honors Program 2022  
Effect of an External Magnetic Field on Nematic Liquid Crystal Droplets, LRSM REU 2021  
Effect of an External Magnetic Field on Nematic Liquid Crystal Droplets, LRSM PSSI 2021  
Probability and Entropy, Notre Dame Institute for Advanced Study 2019

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## POSTERS

The SuperFGD and its Electronics for the T2K Near Detector Upgrade, IMFP 2024  
The SuperFGD and its Electronics for the T2K Near Detector Upgrade, TAE 2024  
Formation of Slow Radioactive Ion Beams for St. Benedict, College of Science Joint Annual Meeting 2021

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## TEACHING EXPERIENCE

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### UNIVERSITY OF PENNSYLVANIA

Philadelphia, PA

*Physics Teaching Assistant*

August 2022 – May 2023

Spring 2023

PHYS 0101; 52 students; engaged in active learning sessions, held office hours, graded quizzes

PHYS 0150; 14 students; instructed during lab sessions, graded pre labs and lab reports

Fall 2022

PHYS 0101; 47 students; instructed during lab sessions, graded pre labs and lab reports

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### HOLY CROSS COLLEGE

Notre Dame, IN

*Physics Lab Assistant*

August 2021 – May 2022

Fall 2021– Spring 2022

PHYS 131, 151, and 152; 17 students; set up, took down, and maintained lab equipment, instructed

during lab sessions

**UNIVERSITY OF NOTRE DAME**

*Physics Teaching Assistant*

Spring 2022

PHYS 21210 and 21220; 156 and 280 students; set up lab equipment, held office hours twice a week

PHYS 11310, 11320, 11422; set up lab equipment

Fall 2020, 2021

PHYS 11310 and 11320; set up lab equipment

Spring 2021

PHYS 11310; 47 students; set up lab equipment, graded pre labs and lab reports, instructed during lab sessions

PHYS 11320; set up lab equipment

Fall 2018 – Spring 2019

PHYS 21210, 21220, 11310, 11320, 11411, 20430; set up lab equipment, explored experimental design options with new Vernier sensors

Notre Dame, IN

September 2018 – May 2022

**LEADERSHIP & SERVICE**

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Researcher/Writer/Editor, Penn Talks Science Podcast	2023 – Present
Member, Penn Science Policy and Diplomacy Group	2022 – Present
Marketing & Outreach VP, Schools & Grants VP, Penn Grad Boxing Club	2022 – Present
Founding Member, Women in Physics Club	2019 – 2022
Member, Women's Boxing Club, Holy Cross Missions Fundraising	2018 – 2022
Gender Relations Point Person, Welsh Family Hall Council	2019 – 2020
Member, Association for Women in Science, STEMentorship Program	2018 – 2020
Summer Volunteer, Appalachia Service Project	2015 – 2019