

EDUCATION

Carnegie Mellon University | Pittsburgh, Pennsylvania
- Ph.D. in Nuclear & Particle Physics

June 2019 - July 2026 (expected)

The College of William & Mary | Williamsburg, Virginia
- B.S. Honors in Physics & Mathematics

August 2015 - May 2019

RESEARCH EXPERIENCE

Carnegie Mellon University | Pittsburgh, Pennsylvania
- Graduate Research Associate

June 2019 - Present

The University of Glasgow | Glasgow, Scotland
- Visiting Researcher

May 2018 - August 2018

RESEARCH PROJECTS

Carnegie Mellon University – GlueX experiment

Advisor: Curtis Meyer | 2019 - Present

- An ongoing search for the existence of exotic hybrid mesons, particularly in the $\pi^0\eta$ and $\pi^0\eta'$ systems, is being performed. The interest in these two systems is due to the strong possibility of the presence of exotic J^{PC} (quantum) numbers in their final states. By comparing both systems, the role of flavor symmetry should be illuminated as to allow for a better understanding of meson production mechanisms.
- During this project, a complete partial wave analysis is being implemented.

The College of William & Mary – GlueX experiment

Advisor: Justin Stevens | 2016 - 2019

- Studied the reaction $\gamma p \rightarrow \pi^0\gamma$ alongside an exploratory study of the Compton scattering process $\gamma p \rightarrow \gamma p$. This was to aid in the understanding of production mechanisms in high-energy photoproduction. The results provided a stepping stone to ultimately measure the Σ beam asymmetry for large angle Compton scattering.
- During this analysis, a fix to the GlueX calorimeter clustering algorithm was implemented in order to view the separation of small decay angles of $\pi^0 \rightarrow \gamma\gamma$.

The University of Glasgow – MAMI experiment

Advisor: Ken Livingston | 2018

- The project's main goal was to develop a compact pair polarimeter and spectrometer for use in hadronic physics experiments at photon beam facilities. A prototype was developed and tested. New challenging techniques were also employed to observe the degree and angle of polarization from electron and positron separation, along with other polarization observables.
- During this project, a brand new approach using machine learning and neural networks was developed to try and gather the problematic degree of polarization for the photons.

PUBLICATIONS

Search for photoproduction of axion-like particles at GlueX

DOI: Phys. Rev. D 105, 052007 [[Physical Review D](#) | [arXiv](#)]

March 2022

Measurement of Spin Density Matrix Elements in $\Lambda(1520)$ Photoproduction at 8.2 GeV to 8.8 GeV

DOI: Phys. Rev. C 105, 035201 [[Physical Review C](#) | [arXiv](#)]

March 2022

Measurement of beam asymmetry for $\pi^-\Delta^{++}$ photoproduction on the proton at $E_\gamma = 8.5\text{ GeV}$

DOI: Phys. Rev. C 103, L022201 [[Physical Review C](#) | [arXiv](#)]

February 2021

SCHOLARSHIPS & FELLOWSHIPS

The William & Mary Honors Fellowship	<i>April 2018 - May 2019</i>
Howard Hughes Medical Institute Summer Research Fellowship	<i>March 2017 - August 2017</i>
Howard Hughes Medical Institute Summer STEM Course Scholarship	<i>March 2016 - August 2016</i>
The Wren Scholarship	<i>August 2015 - May 2019</i>

HONORS & AWARDS

The Open Science Grid User School <i>Madison, Wisconsin</i>	<i>July 2022</i>
The International HPC School on Challenges in Computational Sciences <i>Athens, Greece</i>	<i>June 2022</i>
Division of Nuclear Physics Travel Grant (<i>Unclaimed due to COVID-19</i>)	<i>February 2020</i>

INVITED SEMINARS & COLLOQUIA

Physics Colloquium – <i>Union College</i>: "Enhancing Scientific Research Utilizing High-Performance & High-Throughput Computing: An Overview With Uses In Nuclear & Particle Physics"	<i>October 2022</i>
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CONFERENCE & WORKSHOP PRESENTATIONS

26th International Conference on Computing in High Energy Physics <i>Norfolk, Virginia</i>	<i>May 2023</i>
APS Division of Nuclear Physics (Virtual due to COVID-19) <i>Boston, Massachusetts</i>	<i>October 2021</i>
Topical Group on Hadronic Physics (Virtual due to COVID-19) <i>Sacramento, California</i>	<i>April 2021</i>
APS Division of Nuclear Physics (Virtual due to COVID-19) <i>New Orleans, Louisiana</i>	<i>October 2020</i>
American Physics Society (Virtual due to COVID-19) <i>Washington, D.C.</i>	<i>April 2020</i>
APS Division of Nuclear Physics Fall Joint Meeting <i>Island of Hawai'i, Hawaii</i>	<i>October 2018</i>
Zone 4 SPS Meeting <i>College Park, Maryland</i>	<i>April 2018</i>
American Physics Society <i>Columbus, Ohio</i>	<i>April 2018</i>

ADMINISTRATIVE EXPERIENCE

AI Super-Resolution Simulations: From Climate Science to Cosmology	<i>February 2022</i>
- Helped organize conference meeting.	

OUTREACH

Pittsburgh Regional Science and Engineering Fair	<i>March 2022</i>
- Presented concepts and research on nuclear and particle physics to high school teachers.	