

Rebecca Rapp

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EDUCATION

M.S. / Ph.D. in Physics (May 2019 / Anticipated 2022)

Carnegie Mellon University, Pittsburgh, PA 15213

- ≈ Field: Experimental nuclear/particle physics, neutrino physics
- ≈ Thesis (*in progress*): Characterizing neutrino and neutron fluxes at the Spallation Neutron Source
- ≈ Advisor: Diana Parno
- ≈ Thesis Committee: Curtis Meyer, Diana Parno, Riccardo Penco, Brian Quinn
- ≈ Highlighted Courses: Introductory Mathematical Physics, Quantum Mechanics I & II, Statistical Mechanics, Classical Electrodynamics I & II, Particle Physics I & II, Quantum Field Theory, Introductory Astrophysics

B.A., Physics & Mathematics (May 2017)

Washington & Jefferson College, Washington, PA 15301

- ≈ Advisors: Michael McCracken (Physics), Faun Doherty (Math)
- ≈ Honors: *Summa Cum Laude*, ΦBK, George Winchester Prize (Physics), Clyde Sheperd Atchison Prize (Math)

GRADUATE RESEARCH ACTIVITIES

- ≈ Member of the COHERENT Collaboration (August 2017 - present)
 - Studying coherent elastic neutrino-nucleus scattering at the Spallation Neutron Source (SNS)
 - Maintainer for a Geant4 simulation predicting the neutrino production at the SNS
 - Advising Aria Salyapongse in her validations against pion production data (May 2020 - present)
 - Advised Shuaixiang Zhang in his simulation of the SNS Second Target Station (Summer 2019)
 - Ongoing work with the MARS neutron monitoring subsystem (simulation and data analysis)
 - Advising Duy Hoang in his construction of a detailed Cf252 fission source (May 2020 - present)
 - Contributing to design and commissioning studies for a D₂O detector to normalize neutrino flux
 - Serving as Data Coordinator for the collaboration (June 2020 - present)
- ≈ Worked with Brian Quinn to characterize photomultiplier tubes for parity-violation experiments and achieved nonlinearity on the order of 0.2% under CReX operating conditions (August - December 2018)

GRANTS AWARDED

- ≈ DOE Office of Science Graduate Student Research Award (DE-SC0014664, Solicitation 2020-1)
 - Project title: Investigating neutrino and neutron fluxes at the Spallation Neutron Source
 - Collaborating DOE Scientist: Jason Newby, Oak Ridge National Laboratory

TECHNICAL SKILLS

- ≈ Programming:
 - Languages/Tools: python, Mathematica, LabVIEW, Arduino, C++, Geant4, ROOT, RooFit, coda
 - Techniques: large-scale data analysis, data visualization and fitting, Monte Carlo simulation, basic instrument interfacing, data acquisition
- ≈ Electronics: basic circuit construction, photomultiplier tube alterations, high voltage, data acquisition

PUBLICATIONS

- ≈ [First constraint on coherent elastic neutrino-nucleus scattering in argon](#)
COHERENT collaboration, Phys. Rev. D. **100**. 115020 – 9 December 2019.
- ≈ [Sensitivity of the COHERENT Experiment to Accelerator-Produced Dark Matter](#)
COHERENT collaboration, Phys. Rev. D. **102**. 052007 – 29 September 2020.

PREPRINTS

- ≈ [First Detection of Coherent Elastic Neutrino-Nucleus Scattering on Argon](#)
COHERENT collaboration, 2020 preprint, arXiv: 2003.10630v1 [nucl-ex]
- ≈ [COHERENT 2018 at the Spallation Neutron Source](#)
COHERENT collaboration, 2018 white paper. arXiv:1803.09183v2 [physics.ins-det]

CONFERENCE PROCEEDINGS

- ≈ [COHERENT Plans for D₂O at the Spallation Neutron Source](#)
American Physical Society Division of Particles & Fields Meeting 2019. arXiv: 1910.00630 [physics.ins-det]

RECENT PRESENTATIONS

- ≈ Invited: [Impact of a NA61/SHINE Low-E Beamline on the COHERENT experiment](#)
NA61/SHINE at Low Energy, Zoomland (9 December 2020)
- ≈ Contributed: [ORNL Neutrino Flux Simulations: FTS and STS](#)
Magnificent CEvNS Workshop 2020, Zoomland (17 November 2020)
- ≈ Contributed: Investigating the background neutron flux for COHERENT with MARS
American Physical Society Division of Nuclear Physics Annual Meeting, Zoomland (1 November 2020)
- ≈ Poster: [Studying neutron backgrounds for COHERENT with MARS](#)
XXIX International Conference on Neutrino Physics and Astrophysics, Zoomland (22 June 2020)
- ≈ Invited: [ORNL Neutrino Flux Simulations: FTS and STS](#)
Magnificent CEvNS Workshop 2019, Chapel Hill, NC (11 November 2019)
- ≈ Contributed: [COHERENT Plans for D₂O at the Spallation Neutron Source](#)
American Physical Society Division of Particles & Fields Meeting, Boston, MA (1 August 2019)
- ≈ Invited: [Spallation Neutron Source Neutrino Flux](#)
Workshop on Fundamental Physics at the Second Target Station, Oak Ridge, TN (27 July 2019)
- ≈ Contributed: [Pion production at the Spallation Neutron Source](#)
The 15th International Conference on Meson-Nucleon Interactions and the Structure of the Nucleon, Pittsburgh, PA (4 June 2019)
- ≈ Poster: [Neutrino Flux Simulations at the ORNL Spallation Neutron Source](#)
XXVIII International Conference on Neutrino Physics and Astrophysics, Heidelberg, Germany (6 June 2018)

TEACHING EXPERIENCE

- ≈ Teaching Assistant for 33-142: Physics II for Engineering and Physics Students August - December 2020
Department of Physics, Carnegie Mellon University Supervisor: Hael Collins
- ≈ Teaching Assistant for 33-121: Physics I for Science Students August 2017 - May 2019
Department of Physics, Carnegie Mellon University Supervisors: Stephen Garoff, Manfred Paulini
- ≈ Math and Physics Tutor August 2014 - May 2017
Peer-Assisted Learning, Washington & Jefferson College Supervisor: Doree Baumgart

PROFESSIONAL DEVELOPMENT

- ≈ Junior Member Representative to the COHERENT Collaboration Board (January 2020 - January 2021)
 - Ex-officio member of COHERENT's Diversity & Inclusion Action Committee (July 2020 - January 2021)
- ≈ American Physical Society's Conferences for Undergraduate Women in Physics
 - Contributed to the national application review and will chair sessions at virtual CUWiP 2021
 - [Served in leadership roles during the organization of PghCUWiP in 2020](#)
 - Drafted initial proposal to APS to host a CUWiP site in Pittsburgh
 - Member of the national organizing committee, chaired local admissions and logistics committees
 - Led coordination of volunteers, served as primary point of contact for all participants
 - Panelist for *Work/Life Balance: Personal Interests*, chaired student research talk session
 - Assisted with networking events as a graduate student in 2019 (TCNJ)
 - Attended as an undergraduate in 2016 (ODU/JLab) and 2017 (Princeton)
- ≈ [Constructive Interference: Women and Minorities in Physics](#) (August 2017 - present)

REFERENCES

Assistant Prof. Diana Parno Graduate Research Advisor Department of Physics Carnegie Mellon University dparno@cmu.edu	Associate Prof. Michael McCracken Undergraduate Advisor Department of Physics (Chair) Washington & Jefferson College mmccracken@washjeff.edu
Dr. Belkis Cabrera-Palmer COHERENT Collaborator Radiation and Nuclear Detection Sandia National Laboratories (Livermore) bcabrer@sandia.gov	Prof. Arthur Kosowsky PghCUWiP LOC Member Department of Physics (Chair) University of Pittsburgh kosowsky@pitt.edu
Aria Salyapongse Research Mentee Department of Physics Carnegie Mellon University asalyapo@andrew.cmu.edu	Prof. Stephen Garoff TA Course Instructor Department of Physics Carnegie Mellon University sg2e@cmu.edu