Rebecca Rapp

Graduate Student, Carnegie Mellon University, Pittsburgh, PA, 15213
Email: rrapp@andrew.cmu.edu **Phone:** 724-809-1951

Education

M.S. / Ph.D. in Physics (May 2019 / Anticipated 2022)
Carnegie Mellon University, Pittsburgh, PA 15213

- Field: Experimental nuclear/particle physics, neutrino physics
- 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 Electrodymanics 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
    - Advised Shuaixiang Zhang in his construction of the SNS Second Target Station (Summer 2019)
  - Ongoing work with the MARS neutron monitoring subsystem (simulation and data analysis)
  - Contributing to design studies for a D_2O detector to normalize neutrino flux
  - Investigating optimal bin edges for fits in photoelectrons detected and recoil time
  - Serving as Data Coordinator for the collaboration (January 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)

Publications

- First constraint on coherent elastic neutrino-nucleus scattering in argon
  COHERENT collaboration, Phys. Rev. D. **100**. 115020 – 9 December 2019.

Preprints

- Sensitivity of the COHERENT Experiment to Accelerator-Produced Dark Matter
  COHERENT collaboration, 2019 white paper. arXiv:1911.06422v1 [physics.hep-ex]
- COHERENT 2018 at the Spallation Neutron Source
  COHERENT collaboration, 2018 white paper. arXiv:1803.09183v2 [physics.ins-det]

Conference Proceedings

- COHERENT Plans for D_2O at the Spallation Neutron Source
  American Physical Society Division of Particles & Fields Meeting 2019. arXiv: 1910.00630 [physics.ins-det]

Recent Presentations

- Invited: ORNL Neutrino Flux Simulations: FTS and STS
  Magnificent CEvNS Workshop 2019, Chapel Hill, NC (11 November 2019)
- Contributed: COHERENT Plans for D_2O at the Spallation Neutron Source
  American Physical Society Division of Particles & Fields Annual 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 (Neutrino 2018), Heidelberg, Germany (6 June 2018)

Professional Development

- Junior Member Representative to the COHERENT Collaboration Board (January 2020 - present)
- American Physical Society's Conference for Undergraduate Women in Physics
  - 2020: Organization of PghCUWiP
    - 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 in 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)

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: oscilloscopes, basic circuit construction, high voltage operations, PMT base design and DAQ

Teaching Experience

- Teaching Assistant for 33-121: Physics I for Science Students — August 2017 - May 2019
  Department of Physics, Carnegie Mellon University

  Spring 2019 - Recitation (1), Course Center (1), Grading — Professor: Manfred Paulini

  Fall 2018 - Recitation (2), Course Center (1.5), Grading — Professor: Stephen Garoff

  Spring 2018 - Recitation (2), Course Center (2), Grading — Professors: Kunal Ghosh and Matt Walker

  Fall 2017 - Recitation (2), Course Center (1), Grading — Professor: Stephen Garoff
- Math and Physics Tutor — August 2014 - May 2017
  Peer-Assisted Learning, Washington & Jefferson College — Supervisor: Doree Baumgart

References

Assistant Prof. Diana Parno
Graduate Research Advisor
Carnegie Mellon University
dparno@cmu.edu

Associate Prof. Michael McCracken
Department Chair, Undergraduate Advisor
Washington & Jefferson College
mmccracken@washjeff.edu

Dr. Belkis Cabrera-Palmer
Radiation and Nuclear Detection
Sandia National Laboratories (Livermore)
bcabrer@sandia.gov

Prof. Arthur Kosowsky
Department Chair, PghCUWiP LOC Member
University of Pittsburgh
kosowsky@pitt.edu

Prof. Manfred Paulini
Associate Dean for Faculty and Graduate Affairs
Carnegie Mellon University
paulini@cmu.edu

Prof. Stephen Garoff
Course Instructor (TA Responsibilities)
Carnegie Mellon University
sg2e@cmu.edu

Aria Salyapongse
Former student, PghCUWiP volunteer
Carnegie Mellon University
asalyapo@andrew.cmu.edu