Caryn Palatchi
March 2022

Education

University of Virginia
Degree - PhD in Experimental Nuclear Physics (awarded 2019)
Advisor – Dr. Kent Paschke
Thesis - Laser and Electron Beam Technology for Parity Violating Electron Scattering Measurements
GPA - 4.0

Caltech
Degree - Bachelor of Science (awarded 2009**)**
Major- Physics
GPA-3.1

Ohio State University
Degree - Masters of Physics (awarded 2013**)**
GPA- 3.8

Publications

2021 The PREX and CREX Collaborations, **"**New Measurements of the Beam-Normal Single Spin Asymmetry in Elastic Electron Scattering Over a Range of Spin-0 Nuclei", arXiv:2111.04250 [nucl-ex] *(submitted to PRL October2021)*

2021 The Jefferson Lab Hall A Collaboration, **"**Deeply virtual Compton scattering cross section at high Bjorken xB" *(submitted to PRL November 2021)*

2021 K.N. Suzuki et al, **"**The cross-section measurement for the ^{3}H(e, e′K)nnΛ reaction" *arXiv:2110.09104 [nucl-ex]* (*submitted to PTEP October 2021)*

2021 D. Adhikari et al, **"**Accurate Determination of the Neutron Skin Thickness of ^{208}Pb through Parity-Violation in Electron Scattering" PRL 126, 172502 (2021)

2021 C. Palatchi and K. Paschke, "RTP Pockels Cell with Nanometer-Level Position Control" arXiv:2106.09546v1, June 2021

2021 ME Christy et al, "Form factors and two-photon exchange in high-energy elastic electron-proton scattering" arXiv:2103.01842v2, March 2021

2021 The Jefferson Lab Hall A Collaboration, "Deep exclusive electroproduction of π^0 at high Q^2 in the quark valence regime" PRL 127, 152301 (2021)

2019 C**.** Palatchi and K. Paschke, **"**RTP Electro-optic Switch with E-field Gradient Control and Related Method Thereof", United States Provisional Patent Application No. 62/832,414 (2019)

2018 A. Esser et al, "Measurement of the Beam-Normal Single Spin Asymmetry for Elastic Scattering of Carbon at various Q2" PRL 121, 002503 (2018)

2014 Caryn Palatchi, J. M. Dahlström, A. S. Kheifets, I. A. Ivanov, et al, "Atomic delay in Helium, Neon, Argon and Krypton" J. Phys. B 47, 245003 (7pp) 2014

2008 N. R. Sheeley, Jr., A. D. Herbst, C. A. Palatchi, Y.-M. Wang, et al, "Heliospheric Images of the Solar Wind at Earth" The Astrophysical Journal, 675:853Y862, 2008 March 1

2008 N.R. Sheeley, Jr., A. D. Herbst, C. A. Palatchi, Y.-M. Wang, et al, "Secchi Observations of the Sun's Garden-Hose Density Spiral" The Astrophysical Journal, 674:L109-L112, 2008 February 20

Professional Experience

2021-2022 **Research Associate** ***University of Virginia***
Supervisor - Dr. Kent Paschke · (434)-924-4543 · kdp2c@virginia.edu

My main focus was simulation for the MOLLER Experiment as it entered the CD1 stage, performing and supervising heavy simulation tasks in preparation for imminent engineering design and resource allocation. I also presented the release of the CREX result and pushed forwards the publication of Transverse Asymmetry measurements.

2020-2021 **Joint Postdoctoral Fellow at the Center for Frontiers in Nuclear Science**
Stonybrook University - University of Virginia
Supervisors - Dr. Abhay Deshpande · abhay.deshpande@stonybrook.edu
Dr. Kent Paschke · (434)-924-4543 · kdp2c@virginia.edu

I played a major leadership role during the CREX Experiment at Jefferson Lab, serving as run coordinator three times. My responsibilities also included supervising PREX-II data analysis. In my capacity as CFNS fellow, I performed Electron Ion Collider (EIC) simulations for Compton polarimetry.

2019-2020 **Research Associate at Jefferson Laboratory** ***University of Virginia***
Supervisor - Dr. Kent Paschke · (434)-924-4543 · kdp2c@virginia.edu

Responsibilities included taking a central role in coordinating the PREX-II experiment, supervising several graduate students on a regular basis, serving as run coordinator, serving as liaison with the accelerator division in achieving the parity quality beam goals, and supervising data analysis of PREX-II.

2014 - 2019 **Research Assistant** ***University of Virginia***
Advisor - Dr. Kent Paschke · (434)-924-4543 · kdp2c@virginia.edu

Research involved development of an ultra-precise RTP crystal Pockel's Cell polarized source for the MOLLER experiment which will provide unprecedented precision on the measurement of the weak charge of the electron, and Mainz data analysis on the Q^2 dependence of the beam-normal single spin asymmetry in elastic scattering off ^{12}C.

JLab on-site responsibilities include working with the Parity Quality Beam group, performing injector source and parasitic beam studies, data analysis, and preparing Hall A DAQ and hardware for PREX-II and CREX.

2013 - 2014 **Teaching Assistant** ***Ohio State University***
Supervisor - Dr. Andrew Heckler · heckler.6@osu.edu

Teaching introductory physics for Honors Engineering majors. Responsibilities include teaching recitations, labs and substitute lecturing for the professor.

2011 - 2013 **Research Assistant** ***Ohio State University***
Immediate Supervisor - Dr. Manuel Kremer · manuel-kremer@gmx.de

Ultra-fast atomic physics research focusing on interaction between atoms and intense laser pulses on an attosecond timescale. Upgraded a pulsed 10W, 30fs Ti-Sapph laser system and worked with non-linear optical processes.

2009 - 2011 **Teaching Assistant** ***Ohio State University***
Supervisors - Greg Lafyatis · lafyatis@mps.ohio-state.edu , Greg Kilcup · kilcup@physics.ohio-state.edu
Responsibilities included teaching recitations and labs for multiple introductory physics courses.

2008- 2009 **LIGO Lab Assistant** ***Caltech LIGO 40m Lab***
Supervisor - Dr. Rana Adhikari · (626) 395-8709 · rana@ligo.caletch.edu
Wrote scripts in Matlab to examine the correlation between seismic accelerometer measurements and optical interferometer measurements. Built temperature sensors to monitor the vacuum chamber temperature to correlate with the frequencies of mirror mode excitations to filter out thermal noise.

Su 2008 **LIGO Summer Undergraduate Research Fellowship** ***LIGO Livingston, LA***
Supervisor - Dr. Brian O'Reilly · (225) 686-3116 · irish@ligo-la.caltech.edu
Wrote Matlab scripts to analyze seismic data and developed digital filtering techniques to computationally improve LIGO's seismic isolation system, pushing the noise floor down.

Su 2007 **Physical Science Aid** ***Naval Research Lab*** *- Washington DC*
Supervisor - Dr. Neil R. Sheeley · (202) 767-2777 · neil.sheeley@nrl.navy.mil
Modified data analysis programs and fitting procedures in IDL. Compiled a data library and created 'movies' of satellite telescope images to make observations of SECCHI/SOHO data. Coauthored paper appearing in AstroPhysical Journal.

Su 2005 **Electrical Assembly** ***Precision Analytical Instruments*** *- Blue Ash, OH*
Supervisor - Dr. Douglas G. Frank · (513) 984-1600 · info@toolsforanalysis.com
Assembled circuits for commercial analytical instruments and tested them for quality performance. I performed spherical geometry calculations for software which described the mechanics of a precision measurement device for bowling ball manufacturers to assess product quality.

Su 2003 **Microbiology Lab Assistant** ***University of Cincinnati***
Supervisor - Dr. Judith Strong · judith.strong@uc.edu
Performed lab experiments researching the mu opioid receptor. Ran PCR's and gel electrophoresis on DNA samples.

Presentations

Oct 2021 *"CREX: Precision Measurement of the Neutral Weak Form Factor in Elastic Electron-48Ca Scattering",* DNP Fall Meeting

Apr 2021 *"PREX-II: Measuring the Neutral Weak Form-Factor of 208Pb",* Carnegie Mellon University

Apr 2021 *"Polarized Electron Source for the MOLLER Experiment",* APS April Meeting

Mar 2021 *"Perspectives on Parity Violation Electron Scattering Experiments and Electron Beam Asymmetries",* Mississippi State University

Jan 2021 *"New Measurement of the Neutral Weak Form-Factor of the Pb-208 Nucleus: PREX-II"*, Institute for Nuclear Theory SINT Seminar Series

Oct 2020 *"Polarized Electron Source for the MOLLER Experiment"*, DNP Fall Meeting

Jul 2020 *"Measurements of Transverse Beam Asymmetry for Elastic Electron Scattering Off Various Nuclei from PREX-II and CREX"*, Jefferson Laboratory

Mar 2020 *"PREX-II: Parity Violation Electron Scattering and Electron Beam Asymmetries"*, New Mexico State University

Feb 2020 *"PREX-II: Parity Violation Electron Scattering and Electron Beam Asymmetries"*, Indiana University

Oct 2019 *"Polarized Electron Beam for PREX-II",* APS Division of Nuclear Physics

Feb 2019 *"Upcoming Parity Violation Experiments and the New RTP Pockels Cell"*, Jefferson Lab

Aug 2018 *"Future High-Precision Parity Violation Experiments at JLab",* Medium Energy Physics Seminar at Argonne National Lab

Apr 2018 *"Polarized Electron Source for the MOLLER Experiment"*, Nuclear Physics Seminar at University of Virginia

Nov 2017 *"RTP (Rubidium Titanyle Phosphate) Pockels Cell for Electron Accelerator Facility"*, Electromagnetic Interactions with Nucleons and Nuclei (EINN) Poster Presentation

Oct 2017 *"Pockels Cell for Electron Accelerator Facility"*, ARCS Awards Poster Presentation

Jan 2017 "Polarized Electron Source for the MOLLER Experiment ", APS April Meeting

Jan 2017 *"Measurements of the Neutron Skin of 208Pb and 48Ca"*, JLab Hall A Collaboration Meeting

Nov 2016 *"Polarized Electron Source for the MOLLER Experiment"*, SESAPS

Aug 2016 *"JLab Parity Beam Studies -12GeV Era",* Physics Beyond the Standard Model and Precision Nucleon Structure Measurements Conference, Trento, Italy

Awards & Fellowships

- CFNS-University Joint Postdoctoral Fellow 2020-2021
- ARCS(Achievement Rewards for College Scientists) Scholar for 2017-2018
- JSA Jefferson Lab Graduate Fellowship award for 2017-2018
- JSA Jefferson Lab Graduate Fellowship award for 2016-2017

Committees

2021 QCD Evolution at UVA Conference Organizing Committee
2017-2018 JLab User Group Board of Directors
2017 CUWiP Conference UVA Organizing Committee
2013 Society of Women in Physics - OSU
2010- 2013 University Judicial Panel
2010 Colloquium Committee