Ryan Zielinski

DeMeritt Hall 103, 9 Library Way, Durham, NH 03824
(518) 669-0012 · rbziel@jlab.org · http://nuclear.unh.edu/~ryan/

Research Skills

Experimental physics, scientific analysis of large data-sets, machine learning, particle detectors, data acquisition systems, polarized nuclear targets, electron scattering, digital and analog circuit design

Computer Skills

Languages: Python, Fortran, C++, C, Java, CSS, HTML, PHP, Perl, MySQL, Unix shell scripts
Applications: ROOT, GEANT4, LabVIEW, LaTeX, Adobe Dreamweaver, Illustrator, and Photoshop, Windows database, spreadsheet, and presentation software
Algorithms: Linear regression, logistic regression, neural networks, support vector machines
Operating Systems: Unix/Linux, Mac OS, Windows

Education

University of New Hampshire, Durham, New Hampshire
Ph.D. Candidate, Physics **August 2010 - Summer 2017**

- Dissertation Topic: "The Proton Spin Structure Function, g_2"
- Advisor: Karl J. Slifer

The College of William and Mary, Williamsburg, Virginia
B.S. Physics, Cum Laude **August 2006 - May 2010**

- Senior Thesis Topic: "Testing and Analysis of Q-Weak's Multiplexing Electronics System"
- Advisor: David Armstrong

Honors and Awards

JSA Junior Scientist Travel Award, 2015
UNH Graduate School Travel Grant, 2015
James M. E. Harper Fellowship, 2014
Chiong Ming and Shu Yin Chen Student Support Fellowship, 2012

Research Experience

University of New Hampshire, Durham, New Hampshire
Graduate Research Assistant **August 2010 - Present**

2012 - Present : Analysis of polarized electron-proton scattering data from thesis experiment

- Create and manage MySQL database for experiment. Develop a web interface in PHP and HTML, and C++ and Python libraries for integration into the analysis stream
- Write software in Python, C++ and ROOT to efficiently analyze terabytes of data. Analysis includes detector/scaler calibrations, and cross section and asymmetry measurements
- Develop Monte-Carlo method using a combination of Python and Fortran code for radiative corrections (RC) analysis, including in-depth systematic error analysis of RC procedure

2012 - Present : Member of the UNH solid polarized target group

- Create safety and operational procedures for high-current 7 T superconducting magnet
- Help implement nuclear magnetic resonance (NMR) circuitry used to calculate target polarization
- Generate LabVIEW virtual instruments (VIs) to control laboratory data acquisition equipment

2011 - 2012 : Prepared and ran thesis experiment at Thomas Jefferson National Lab

- Designed and implemented trigger and data acquisition (DAQ) system for E08-027 in Hall A using NIM, CAMAC, FASTBUS and VME logic modules
- Prepared and calibrated the high-resolution spectrometer detector package for scattered electrons. Package included wire chambers, scintillators, Cherenkov detector and calorimeters
- Achieved record Hall A DAQ rate. Improvement made by using an optimal layout of acquisition electronics, aided by modeling the DAQ dead-time using Poisson probability theory

The College of William and Mary, Williamsburg, Virginia
Research Experience for Undergraduates Student Researcher **May 2009 - August 2009**
Collaborated on construction and testing of vertical drift chambers for the Q-Weak experiment. Included development of a testing procedure for multiplexing electronics used in data read-out

Teaching Experience

University of New Hampshire, Durham, New Hampshire
Graduate Teaching Assistant **August 2010 - December 2010**
Lab instructor for analog and digital electronics lab for junior undergraduates

Publications

In Preparation

R. Zielinski, *et al.*, "Inclusive Electron-Nucleus Scattering of ^{3}He and ^{14}N." *Phys. Rev. C.*

Peer Reviewed

P. Zhu, *et al.*, "Beam Position Reconstruction for the g2p Experiment in Hall A at Jefferson Lab." *Nucl. Inst. Meth.* **A808** 10 (2016).

R. Zielinski, "The Proton Spin-Dependent Structure Function, g_2, at Low Q^2." Eighth International Workshop on Chiral Dynamics, PoS CD15:090 (2015).

T. Allison, *et al.*, "The Q_{weak} Experimental Apparatus." *Nucl. Inst. Meth.* **A781** 133 (2015).

I. Korover, *et al.*, "Probing the Repulsive Core of the Nucleon-Nucleon Interaction via the ^{4}He(e,e'pN) Triple-Coincidence Reaction." *Phys. Rev. Lett.* **113** 022501 (2014).

S. Riordan, *et al.*, "Hall A Annual Report : Progress Report for E08-027." arXiv:1302.4324 (2012).

Conference Presentations

Invited Talks

Precision Radiative Corrections for Next Generation Experiments, Newport News, VA.
Systematic Error in the Mo and Tsai Inclusive Radiative Corrections Scheme, R. Zielinski. May 2016.

Contributed Talks

University of New Hampshire Graduate Research Conference, Durham, NH.
Determining Proton Structure from Electron Scattering Experiments, R. Zielinski. April 2016.

Eighth International Workshop on Chiral Dynamics, Pisa, Italy.
The Proton Spin-Dependent Structure Function, g_2, at Low Q^2, R. Zielinski. July 2015.

American Physical Society DNP Meeting, Newport News, VA.
The Proton Spin-Dependent Structure Function, g_2, and Longitudinal Transverse Spin Polarizability at Low Q^2, R. Zielinski. October 2013.

Jefferson Lab Hall A Spring Collaboration Meeting, Newport News, VA.
Hall A DAQ Status and Performance Update, R. Zielinski. June 2012.

Contributed Posters

Gordon Research Conference on Photonuclear Reactions, Holderness, NH.
The Proton Structure Function, g_2, at Low Q^2, R. Zielinski. August 2014.

Gordon Research Conference on Photonuclear Reactions, Holderness, NH.
The g_2^p Experiment: A Measurement of the Proton's Transverse Spin Structure Function, R. Zielinski and M. Cummings. August 2012.

Jefferson Lab User's Group Meeting, Newport News, VA.
E08-027: A Measurement of the Proton's Transverse Spin Structure Function, R. Zielinski and T. Badman. June 2011.