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RESEARCH EXPERIENCE

- Instrumental in the planning, construction, and assembly of the approved Run I ANNIE detector (Sept. 2015 - present)
 - ▶ Overseeing the development, installation, and operations of a small data acquisition (DAQ) system (consisting of NIM and CAMAC crates, and high voltage power supplies) to measure the beam timing and the PMT performance of the forward veto detector, as part of a student's Master thesis
 - ▶ Working closely with the Mechanical Design Engineering group to design both the base holder and the inner structure that will house the PMTs in the ANNIE tank
 - ▶ Working with a vendor to acquire a tank liner that meets the experiment's light sensitivity requirements
 - ▶ Testing and development of the large area picosecond photodetector (LAPPD) prototype
- In charge of the underground MINERvA DAQ system (2012 - 2015)
 - ▶ 24/7 on-call expert to diagnose and resolve time sensitive run-stopping problems
 - ▶ Perform accesses into the Underground Hall to diagnose and repair faulty hardware
 - ▶ System administrator of the Underground computers
 - ▶ Test and implement hardware and software upgrades to the detector and DAQ
 - ▶ Help instruct and train new experts for the experiment
- In charge of the MINERvA Collaboration 2014 Test Beam Run Light Injection (LI) system (2014 - 2015)
 - ▶ Worked closely with a Fermilab Electrical Engineer to ensure that the LI power supply electronics are safe to operate under normal working conditions
 - ▶ Cleaned and attached LI fibers to the detector's photomultiplier tubes (PMTs), which are used to check the health of the detector and calibrate its electronics
- Led multiple independent analyses of a large and complex data set from conception to publication in a peer-refereed journal (2008 - present)
 - ◆ Measuring the pion production cross section with respect to muon kinematics (MINERvA)
 - ▶ Used the MINERvA 2010 Test Beam data and computer simulations to measure the uncertainty associated with the short track reconstruction algorithm used in the inclusive pion production and quasi-elastic proton plus muon analyses
 - ▶ Mentoring a graduate student at the University of Pittsburgh working on a similar pion production analysis
 - ◆ Searched for the high mass standard model Higgs boson and set limits on the cross section using a trilepton final state ($D\emptyset$)
 - ▶ In charge of the muon channel ($e\mu\mu$), a fourth of the total number of final states studied

- ▶ Gained extensive experience in a small group environment, with the ability to assume command when required
- ◆ Measured the WZ to trilepton cross section and set limits on the beyond standard model decay involving flavor changing neutral currents ($D\emptyset$)
 - ▶ In charge of the two muon channels ($\mu\mu e$ and $\mu\mu\mu$) in both analyses, a third of the total number of final states studied
 - ▶ Gained programming/computer skills in C++, ROOT, Unix shell script, Perl, with some familiarity with Python and HTML
- Provided extensive technical support to the central track trigger system, a crucial component to the operations of the $D\emptyset$ detector (2009 - 2011)
 - ▶ 24/7 on-call expert to diagnose and resolve time sensitive central track trigger problems
 - ▶ Performed accesses into the $D\emptyset$ collision hall to diagnose and repair faulty hardware
 - ▶ Maintained $D\emptyset$ central track trigger online data quality, crucial to particle track reconstruction needed in all $D\emptyset$ analyses
- Assembled and calibrated several top hat electrostatic analyzers used in a rocket flight experiment while at the University of Iowa (2002 - 2003)

EDUCATION AND PROFESSIONAL POSITIONS

Postdoctoral Research Associate, *Iowa State University*, Ames, IA (Sept. 2015 - present)

Joined the ANNIE Collaboration; planning, implementation, and building of the ANNIE detector

Postdoctoral Research Associate, *University of Pittsburgh*, Pittsburgh, PA (Oct. 2012 - Aug. 2015)

Joined the MINERvA Collaboration; studied neutrino-nucleon interactions through pion production

Postdoctoral Research Associate, *University of Manchester*, Manchester, England, UK (May 2012 - Sept. 2012)

Published thesis analysis and joined the MINOS Collaboration; studied three flavour ν_μ oscillations

Ph.D. Experimental Particle Physics, *University of Kansas*, Lawrence, KS (2005 - 2012)

Thesis : *Search for diboson production in trileptons plus missing transverse momentum final states using the RunII $D\emptyset$ detector at $\sqrt{s} = 1.96$ TeV* (Advisor: Prof. Graham Wilson)

M.S. Physics, *University of Iowa*, Iowa City, IA (2001 - 2004)

Thesis : *Calibrations and simulations of the venetian blind electrostatic analyzer* (Advisor: Prof. Craig Kletzing)

B.S. Physics, Astronomy, and Mathematics, *University of Iowa*, Iowa City, IA (1996 - 2001)
(Advisor: Prof. Robert Mutel)

POSITIONS OF RESPONSIBILITY

- Instillation Manager and Run Coordinator for ANNIE Run I (2016)
- In charge of the MINERvA DAQ, including maintenance and upgrades (2012 - 2105)

- Perform MINERvA shifts and expert shifts, vital to make sure that the detector is running optimally (2012 - 2015)
- Elected Fermilab Student and Postdoc Association (FSPA) Officer (Oct. 2012 - Oct. 2013), attended monthly UEC meetings, organized FSPA's annual New Perspectives Conference
- Along with Prof. Wilson, maintained and implemented the VHDL firmware necessary for track reconstruction in the central track trigger (2009 - 2011)
- Performed tracking (2008 - 2011) and data acquisition (2010 - 2011) shifts for the DØ Collaboration, necessary to monitor detector operations and data taking
- Volunteered to perform Tevatron magnet rotational displacement measurements for placement calibrations essential for accelerator operations at Fermilab (2009)
- Selected as the KU Faculty Hiring Committee Graduate Student Representative in the Department's search for an astronomy professor (2007 - 2008)
- Elected KU Society of Physics Students (SPS) Co-President (2007 - 2008)
- Selected as the UI Advisory Board Student Representative (1999 - 2001)
- Elected UI SPS President (1999 - 2001), organized the annual SPS Zone 11 Meeting (2001)
- Elected UI SPS Vice President (1998 - 1999)

SELECTED PUBLICATIONS (PRIMARY AUTHORSHIP)

“Cross sections for ν_μ and $\bar{\nu}_\mu$ induced pion production on hydrocarbon in the few-GeV region using MINERvA”, C.L. McGivern, *et al.* [MINERvA Collaboration], arXiv:1606.07127v3 [hep-ex], Submitted to Phys. Rev. D. (June, 2016).

“MINERvA neutrino detector response measured with test beam data”, L. Aliaga, *et al.* [MINERvA Collaboration], Nuclear Inst. and Methods in Physics Research, A **789** (2015), pp. 28-42.

“Measurement of muon plus proton final states in ν_μ Interactions on Hydrocarbon at $\langle E\nu \rangle = 4.2$ GeV”, T. Walton, *et al.* [MINERvA Collaboration], Phys. Rev. D **91**, 071301 (2015).

“Charged Pion Production in ν_μ Interactions on Hydrocarbon at $\langle E\nu \rangle = 4.0$ GeV”, B. Eberly, *et al.* [MINERvA Collaboration], Phys. Rev. D **92**, 092008 (2015).

“Combined analysis of ν_μ disappearance and $\nu_\mu \rightarrow \nu_e$ appearance in MINOS using accelerator and atmospheric neutrinos”, P. Adamson, *et al.* [MINOS Collaboration], Phys. Rev. Lett. **112**, 191801 (2014).

“Search for Higgs boson production in trilepton and like-charge electron-muon final states with the DØ detector”, V. M. Abazov, *et al.* [DØ Collaboration], Phys. Rev. D **88**, 052009 (2013).

“Search for flavor changing neutral currents in decays of top quarks”, V. M. Abazov, *et al.* [DØ Collaboration], Phys. Lett. B **701**, 313 (2011).

“Measurement of the $WZ \rightarrow \ell\nu\ell\ell$ production cross section and limits on anomalous couplings”, V. M. Abazov, *et al.* [DØ Collaboration], Phys. Lett. B **695**, 67 (2011).

SELECTED PROFESSIONAL PRESENTATIONS AND PROCEEDINGS

“*Prospects and Progress of the Charged-Current Quasi-Elastic(-Like) Cross Section Measurements at MINERvA*”, 9th International Workshop on Neutrino-Nucleus Interactions in the Few GeV Region, Surrey, UK (2014)

“*Neutrino Physics Results at MINERvA*”, IceCube Particle Astrophysics (IPA) Symposium, Madison, WI (2013)

“*Flavor changing neutral currents (FCNC) in $t\bar{b}$ decays at $D\bar{0}$* ”, 19th International Conference on Supersymmetry and Unification of Fundamental Interactions, Batavia, IL (2011)

“*Using trileptons to investigate flavor changing neutral current (FCNC) top quark decays at $D\bar{0}$* ”, American Physical Society (APS) Division of Particles and Fields, Providence, RI (2011)

“*Flavor changing neutral currents in $t\bar{b}$ decays at $D\bar{0}$* ”, Proceedings of the APS Division of Particles and Fields, Providence, RI (2011)

“*Using trileptons to investigate WZ production and FCNC top quark decays at $D\bar{0}$* ”, Lake Louise Winter Institute, Banff, Canada (2011)

“*Measurement of the WZ cross section at the $D\bar{0}$ detector*”, American Physical Society (APS) April Meeting, Washington, DC (2010)

OUTREACH ACTIVITIES

- Lead Public Tours of Fermilab Experiments (2012 - present)
 - ▶ Fermilab Underground Neutrino Experiments
 - ▶ $D\bar{0}$ assembly building, control room, and collision hall
 - ▶ Tevatron Tunnel
- Travelled to Congressional Offices in Washington DC with the Fermilab Users' Executive Committee (UEC) to help lobby for support and funding for particle physics (2013 - 2015)
- Gave a Chalk Talk about neutrino oscillations and my academic experiences to a visiting group of Quarknet teachers (2013)
- Guided students and public on nightly tours of the sky and stars through the Clear Sky Patrol program at the University of Iowa (2001 - 2004)

PROFESSIONAL DEVELOPMENT EXPERIENCE

- Symposium of Excellence in Detectors and Instrumentation Technologies, Fermilab (2012)
- Lake Louise Winter Institute, Banff, Canada (2011)
- The CERN-Fermilab Hadron Collider Physics Summer School, Fermilab (2008)

REFERENCES

- Prof. Matt Wetstein (wetstein@iastate.edu), Iowa State University, Supervisor
- Dr. Deborah Harris (dharris@fnal.gov), Fermilab, MINERvA Spokesperson
- Dr. Stefan Gruenendahl (stefan@fnal.gov), Fermilab, DØ CTT Convener

AWARDS

- 2000 and 2001 Departmental Distinguished Service Award for Society of Physics Students Presidential Services, University of Iowa

OTHER ACTIVITIES AND INTERESTS

- Self-taught knitter (2010 - present)
- Participate in the Fermilab softball summer league (2008 - present)
 - Co-Captain (2012 - present)
- Compete in triathlons, cycling, and running races (2002 - present)
- University of Iowa Tae Kwon Do, achieved rank of 2nd Dan (2nd degree black belt) (1998 - 2005)
 - Instructor (1998 - 2005)
 - National collegiate competition team (1998 - 2001)