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RESEARCH INTERESTS

Neutrino physics: Oscillations in long baseline neutrino experiments, currently working on NOvA and MINOS+. Measurement of the θ_{13} mixing angle, CP violation and the neutrino mass hierarchy. Pattern recognition problems. Future long baseline experiments (ELBNF). Large-Area Picosecond Photo-Detectors (LAPPD) in water Cherenkov detectors currently working on ANNIE.

POSITIONS HELD

Associate Professor	Iowa State University	2013-
Assistant Professor	Iowa State University	2009-2013
Joint Appointment	Argonne National Laboratory	2009-
Assistant Physicist	Argonne National Laboratory	2007-2009
Postdoctoral Fellow	Harvard University	2003-2007

EDUCATION and TRAINING

Tufts University	**Ph.D**., Physics	1996-2003
Tufts University	**M.Sc**., Physics	1996-1998
Universidad de Los Andes, Venezuela	**B.S**., Physics	1990-1995

HONORS and AWARDS

2012 Presidential Early Career Award for Scientists and Engineers (PECASE)
2012 Official Recognition from the Office of the Governor of the State of Iowa
2012 Iowa State University Award for Early Achievement in Research
2011 NSF CAREER Award
2009 HENAAC Outstanding Technical Achievement Award

SELECTED RESEARCH and PROFESSIONAL EXPERIENCE

- Co-leader for the Accelerator Neutrino Neutron Interaction Experiment (ANNIE) proposal to the Fermilab Physics Advisory Committee (2014-).
- Convener of the electron neutrino appearance analysis in the NOvA experiment (since 2012).
- Co-leader of the computing and infrastructure group for the NOvA experiment (2012-2014).
- Convener of Computing for the Intensity Frontier group for Snowmass 2013.
- Convener for Large-Area and Cost Effective Detector for Neutrinos and Proton Decay group in the Project X Physics Study 2012 at Fermilab.
- Physics Letters B referee (since 2012).
- NSF and DOE reviewer (since 2012).
- Leader of the study the application of large-area fast photo-detectors on the next generation of water Cerenkov detectors.
- Elected member of the MINOS Executive Committee by the Institutional Board (since 2011).
- Co-leader of the calibration design of the large water Cherenkov detector for LBNE (2009-2012). Level III manager for this effort. Responsible for the Conceptual Design Report Calibration chapter.
- Leader of the offline software group for the NOvA experiment (2009-2012). Responsible for simulations and reconstruction for the experiment. Also responsible for computing infrastructure.
- Elected member of the NOvA Executive Committee by the Collaboration (since 2009).
- Convener of the electron neutrino appearance analysis group in the MINOS experiment (2004-2009). Lead the first analysis effort to observe electron neutrino appearance in the MINOS experiment. Co-authored the 2009 publication in *Phys. Rev. Lett*.
- Elected member of the Fermilab User's Executive Committee (UEC) (2009-2011).
- Coordinator of the Batch Processing group in the MINOS experiment (2005-2007).
- Leader of the Data/MC Reconstruction Validation effort for MINOS (2005-2007).
- Oscillation analysis of atmospheric neutrinos in Soudan 2. Primary author of *Phys. Rev. D* paper confirming the discovery of oscillations in atmospheric neutrinos. Result cited in the PDG review.

SELECTED RECENT TALKS

- **R&D on Photosensors for Water and Liquid Scintillator Detectors** (invited parallel talk), 15th Annual International Workshop on Next Generation Nucleon Decay and Neutrino Detectors (NNN14). Paris, France, Nov 4, 2014.
- **Challenges for Long-Baseline Neutrino Experiments** (invited lecture), Fermilab Lecture Series: The Allure of Ultrasensitive Experiments, Batavia, IL, May 23, 2014.
- **The NOvA Experiment: Status and Physics Reach** (invited plenary talk) ISOUPS 2013: International Symposium: Opportunities for Underground Physics for Snowmass, Asilomar, CA, May 24-27, 2013.
- **Using Large-Area Fast Photosensors in Future Neutrino Detectors** (invited plenary talk), Aspen Winter Workshop 2013 – New Directions in Neutrino Physics, Aspen, Co, Feb 5, 2013.
- **Status and Development of Photodetection for NNN Detectors** (invited plenary talk), 13th Annual International Workshop on Next Generation Nucleon Decay and Neutrino Detectors (NNN12). Batavia, IL, Oct 6, 2012.
- **Neutrino Interaction Systematic Errors in MINOS and NOvA** (invited parallel talk), 13th International Workshop on Neutrino Factories, Superbeams and Betabeams (NuFact12). Williamsburg, VA, July 24, 2012.

SELECTED REFEREED PAPERS

- **Electron Neutrino and Anti-Neutrino Appearance in the Full MINOS data sample**, Minos Collaboration (with P. Adamson et. al.), accepted by Phys. Rev. Lett (2013).
- **Improved Measurement of Muon Antineutrino Disappearance in MINOS**, Minos Collaboration (with P. Adamson et. al.), Phys. Rev. Lett. 108, 191801 (2012).
- **Improved Search for Muon-neutrino to Electron-neutrino Oscillations in MINOS**, Minos Collaboration (with P. Adamson et. al.), Phys. Rev. Lett. 107, 181802 (2011).
- **Measurement of the Neutrino Mass Splitting and Flavor Mixing by MINOS**, Minos Collaboration (with P. Adamson et. al.), Phys. Rev. Lett. 106, 181801 (2011).
- **Search for Muon-neutrino to Electron-neutrino Transitions in MINOS**, Minos Collaboration (with P. Adamson et. al.) Phys. Rev. Lett. 103, 261802 (2009).
- **Observation of Muon Neutrino Disappearance with the MINOS Detectors and the NuMI Neutrino Beam**, Minos Collaboration (with D.G. Michael et. al.) Phys. Rev. Lett. 97, 191801 (2006).
- **Observation of Atmospheric Neutrino Oscillations in Soudan 2**, Soudan 2 Collaboration (M. Sanchez et al.) Phys. Rev. D 68, 113004 (2003).
- **The Atmospheric Neutrino Flavor Ratio from a 3.9 Fiducial Kiloton-Year Exposure of Soudan 2**, Soudan-2 Collaboration (with W.W.M. Allison et al.) Phys. Lett. B449: 137-144, (1999).

FUNDED PROPOSALS/EXTERNAL FUNDING

- 2012-2016 Principal Investigator on DOE grant: "Neutrino Physics in the NOvA Experiment".
- 2011-2016 NSF CAREER Award, "CAREER: Next Generation Neutrino Water Cherenkov Detectors Using Large-Area Fast Photosensors".
- 2014-2015 – Principal Investigator on subcontract for Argonne National Laboratory on "Muon Neutrino Disappearance and Commissioning in NOvA".
- 2013-2014 – Principal Investigator on subcontract for Argonne National Laboratory on "Applying LAPPDs to Neutrino Detectors and Measuring the Beam Electron Neutrino Background in the NOvA Experiment ".
- 2012-2013 – Principal Investigator on subcontract for Argonne National Laboratory on "Applying LAPPDs to Neutrino Detectors".
- 2010-2012 Principal Investigator on subcontract for the Long Baseline Neutrino Experiment (LBNE), "Design of a complete calibration system for the LBNE Water Cherenkov Detector".
- 2009-2015 Joint Appointment with Argonne National Laboratory.

STUDENT ADVISING

- **Ph. D. Students (major professor):** Tian Xin (Fall 2010-in progress), Jose Andres Sepulveda Quiroz (Summer 2012-in progress). Erika Catano-Mur (Summer 2013-in progress).
- **M. Sc. Students (major professor):** Tim Kutnink (2009-2012).
- **Undergraduate students (major professor):** David Grzan (Fall 2014-in progress) Carly Taylor (Fall 2014-in progress) Thomas Knief (Summer 2013) Alyssa Miller (Spring 2012-Summer 2012), Abhishek Vemuri (Summer 2011-Fall 2011), Andrew Nguyen. (Spring 2010-Spring 2011), Maria Bustos (Spring 2010), Craig Cunningham (Spring 2010).

- **Ph. D. Students (co-advisor):** Josh Boehm (2003-2009), Steven Cavanaugh (2006-2009), Minerba Betancourt (Summer 2008).

ISU PHYSICS AND ASTRONOMY TEACHING

- 2010-2015 Classical Mechanics (Phys 361) and Intermediate Mechanics (Phys 362).
- Spring 2010 Electricity and Magnetism (Phys 222) recitations.

ISU PHYSICS AND ASTRONOMY SERVICE

- 2012-2013 Curriculum Committee
- 2012 Classical Qualifying Exam Committee
- 2010-2015 Student Recruitment and Undergrad Visits Committee
- 2010-2012 Diversity Committee
- 2009-2010 Search Committee, High Energy Physics Faculty

ISU PHYSICS AND ASTRONOMY OUTREACH

- 2012-2016 Founder and Faculty Advisor of the Undergraduate Women in Physics Group.
- 2012 Outreach sessions at First Annual STEM Forum for Middle School Girls at the Prairie Ridge Middle School. Ankeny, IA. May 5, 2012.