

# Jonathan Asaadi

## Curriculum Vitae

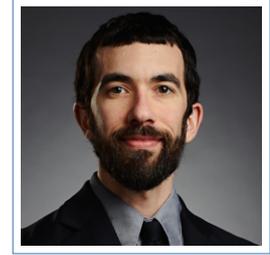
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## Appointments

2015 - Present **Assistant Professor**, University of Texas Arlington , Arlington, TX.

2012 - 2015 **Post-Doctoral Researcher**, Syracuse University, Syracuse, NY.

## Education

Awarded 2012 **Ph.D. Physics**, Texas A&M University , College Station, TX.

**Thesis Topic:** Search for New Physics in the Exclusive  $\gamma$ +Missing Transverse Energy Channel in  $p\bar{p}$  collisions at  $\sqrt{s} = 1.96$  TeV

**Advisor:** Professor David Toback

Awarded 2007 **M.S. Physics**, Texas A&M University , College Station, TX.

**Thesis Topic:** Supersymmetry, New Physics Prospects, & Grid Computing

**Advisor:** Professor David Toback

Awarded 2004 **B.S. Physics**, University of Iowa, Iowa City, IA.

*Minor in Mathematics*

## Awards

2014 Albert Einstein Center Visiting Fellow, Laboratory for High Energy Physics (LHEP) University of Bern, Switzerland

2009 Sen. Gramm Doctoral Fellowship Nominee

2008 American Association of Physics Teachers Outstanding Teaching Assistant

2004 Whitmore Fellowship for Graduate Studies at Texas A&M

2002 - 2003 University of Iowa College of Science Dean's List

2002 Roy J. Carver Scholastic Scholarship, University of Iowa

## Physics Research

- Precision measurements of neutrino properties utilizing short and long baseline accelerator based beams.
- Liquid Argon Time Projection Chamber (LArTPC) detector technology development and research.
- Neutral current  $\pi^0$  production measurements and background estimation in neutrino oscillation measurements.

- Highly parallelized computing utilizing Graphics Processing Units (GPU's) for real-time pattern recognition in LArTPC experiments.
- Signature based searches for non-standard weakly interacting massive particles in neutrino fixed target experiments .
- Direct neutrino mass measurements utilizing Mössbauer techniques.

## Selected Publications

*A complete list of publications and technical notes is available upon request*

**Measurement of the inclusive neutral current  $\pi^0$  cross-section with the ArgoNeuT detector in the NuMI low energy beam ,**

*ArgoNeuT Collaboration: R. Acciarri et al.*

Paper in preparation

**ArgonCube: a novel, fully-modular approach for the realization of large-mass liquid argon TPC neutrino detectors ,**

*ArgonCube Collaboration: C. AMSLER et al.*

CERN-SPSC-2015-009

**Testing of High Voltage Surge Protection Devices for Use in Liquid Argon TPC Detectors ,**

*J. Asaadi, J.M. Conrad, S. Gollapinni, B.J.P. Jones, H. Jostlein, J.M. St. John, T. Strauss, S. Wolbers, J. Zennamo.*

JINST 9 P09002 (2014), arXiv:1406.5216

**The detection of back-to-back proton pairs in Charged-Current neutrino interactions with the ArgoNeuT detector in the NuMI low energy beam,**

*ArgoNeuT Collaboration: R. Acciarri et al.*

Phys. Rev. D 89, 112003 (2014), arXiv:1405.4261

**Signature-based search for delayed photons in the exclusive photon plus missing transverse energy events from  $p\bar{p}$  collisions with  $\sqrt{s} = 1.96$  TeV,**

*CDF Collaboration: T. Aaltonen et al.*

Phys. Rev. D 88, 031103(R) (2013), arXiv:1307.0474

**Snowmass 2013 Young Physicists Science and Career Survey Report,**

*J. Anderson, J. Asaadi, B. Carls, R. Cotta, R. Guenette, B. Kiburg, A. Kobach, H. Lippincott, B. Littlejohn, J. Love, B. Penning, M. Soares Santos, T. Strauss, A. Szec, E. Worcester, F. Yu.*

Snowmass White paper SNOW13-00132, arXiv:1307.8080

## Leadership roles, highlighted accomplishments, and group service

- 2012–Present **Co-Convener MicroBooNE Astro-Particle and Exotics Physics Group.**  
This role is responsible for:
- Cosmic ray background measurements and removal for the MicroBooNE experiment
  - Supernova neutrino background studies in utilizing LArTPC's
  - Signature based searches for new hidden/dark sector physics in LArTPC's
  - Proton decay background studies using spallation sources in LArTPC's
  - New detector technology and readout techniques for use in LArTPC's
- My accomplishments thus far while in this role:
- Guided various detector R&D papers to publication [3, 4]
  - Began new exotics program searching for Hidden/Dark Sector Physics
  - Coordinate the analysis team responsible for cosmic ray tagging
  - Co-lead research in utilizing GPU's for real time pattern recognition in LArTPC's
  - ***This role is still on going....***
- 2013–Present **MicroBooNE Time Projection Chamber (TPC) Commissioning Coordinator.**  
This role is responsible for:
- Contribute to the construction and deployment of the MicroBooNE TPC
  - Developing the commissioning plan for the MicroBooNE TPC
  - Verifying the commissioning data and deciding on necessary corrections
- My accomplishments thus far while in this role:
- Lead the winding, installation, and testing of the MicroBooNE TPC wire planes [5]
  - Co-lead the cleaning, construction, and installation of the MicroBooNE TPC
  - ***This role is still on going....***
- 2013–Present **LArIAT Time Projection Chamber (TPC) Commissioning Coordinator.**  
This role is responsible for:
- The construction and testing of the LArIAT TPC and wireplanes
  - Lead the deployment of the high voltage, light detection system, and TPC and vacuum systems
  - Co-lead in the development a commissioning plan for the first test-beam run
  - ***This role is still on going....***
- 2013–2015 **MicroBooNE Data Production Manager.**  
This role is responsible for:
- Develop structure for verifying data taken online by the MicroBooNE DAQ
  - Processing and storing the data taken into a central database
  - Ensuring the data is cataloged and accessible to the collaboration

2012–2013 **Convener for the Snowmass Young Physicists Group.**

This role is responsible for:

- Organizing young physicists to contribute to the Community Summer Study 2013
- Coordinating speakers from the DOE and NSF to come to speak to young physicists
- Organizing town-hall meetings between the national labs and their young physicists users

My accomplishments while in this role:

- Organizing 10 different town-hall meetings at 4 different national labs for young physicists during the Snowmass process
- Successfully wrote, administered, and analyzed data from a survey of over 1000 physicists to express their interests and concerns during the Snowmass planning process [6]
- Published the results of the survey as a Snowmass Whitepaper that was ultimately used by the Particle Physics Project Prioritization Panel (P5) [7]
- Speaking to the plenary session at Snowmass 2013 and raising the concerns of young physicists and their role in the future of HEP to the general audience
- Giving interviews to the media leading up to and during the Snowmass process [8, 9]

2007–2012 **Research Assistant on the CDF Experiment.**

This role is responsible for:

- Maintenance and operation of the Electromagnetic Calorimetry Timing System
- Support for the online monitoring program known as ObjectMon
- CDF Shift Crew ACE: Data Acquisition Quality Expert (April - August 2009)
- CDF Shift Consumer Operator: Data Quality Shifts (January 2008 & January 2010)

My accomplishments while in this role:

- Lead the timing calibration of the Central Outer Tracker (COT) for use in the delayed photons searches
- Published the first exclusive  $\gamma_{delayed} + \text{Missing Transverse Energy}$  signature based search for physics beyond the Standard Model [10]

2007–2010 **Research Assistant on the CMS Experiment.**

This role is responsible for:

- Developing the SUSY-Physics Analysis Tool for use in the search for Supersymmetry at high  $\tan \beta$  in the Jet+Missing Transverse Energy+ $\tau$  final state
- Data quality monitoring shifts at the CMS Remote Operations Center (ROC) at Fermi National Lab during commissioning cosmic ray runs (CRUZET II, CRUZET III, and CRAFT) [11]

2006–2007 **Graduate Student Representative, Dept. of Physics, Texas A&M.**

This role is responsible for:

- Attending university senate meetings
- Organizing meetings with graduate students in the physics department
- Hosting prospective physics department graduate student candidates

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## Selected Seminar and Invited Conference Talks

[A complete list of talks is available upon request](#)

October 2015 **Coordinating Panel for Advanced Detectors (CPAD) Instrumentation Frontier Meeting,**

*Arlington, TX.*

New Technologies for Neutrino Oscillations

September **Yale University Weak Interaction Discussion Group (WIDG) Seminar,**

2015 *New Haven, CT.*

The Liquid Argon In A Testbeam (LArIAT) Experiment

- June 2015 **25th Workshop on Weak Interactions and Neutrinos (WIN2015)**,  
*Heidelberg, Germany.*  
The Fermilab Short-Baseline Neutrino Program
- May 2015 **University of Texas, Arlington Particle Physics Colloquium**,  
*Arlington, TX.*  
At the Forefront of Neutrino Oscillation Physics
- April 2015 **23rd International Workshop on Deep-Inelastic Scattering and Related Subjects (DIS2015)**,  
*Dallas, TX.*  
Detection of charged current zero  $\pi$  and neutral current  $\pi^0$  final states in the ArgoNeuT experiment
- April 2015 **Fermi National Accelerator Laboratory, Invited Physics Seminar**,  
*Batavia, IL.*  
Innovating at the Forefront of Precision Neutrino Oscillation Physics
- February 2015 **University of California, Irvine Particle Physics Seminar**,  
*Irvine, CA.*  
Innovating at the Forefront of Precision Neutrino Oscillation Physics
- January 2015 **Iowa State University Dept. of Physics and Astronomy Colloquium**,  
*Ames, IA.*  
Innovating at the Forefront of Precision Neutrino Oscillation Physics
- August 2014 **20th Particles and Nuclei International Conference 2014 (PANIC2014)**,  
*Hamburg, DK.*  
The MicroBooNE Experiment
- May 2014 **9th International Workshop on Neutrino-Nucleus Interactions in the Few GeV Region (NuInt14)**, *Surrey, UK.*  
Future prospects of electron/photon separation and Neutral Current  $\pi^0$  measurements with Liquid Argon TPCs and other methods
- May 2014 **Massachusetts Institute of Technology Laboratory for Nuclear Science Lunchtime Seminar**, *Cambridge, MA.*  
The MicroBooNE and ArgoNeuT Experiments and the Future of Liquid Argon Time Projection Chambers
- January 2014 **Texas A&M Physics Department Phenomenology, and Experiment Seminar**,  
*College Station, TX.*  
The ArgoNeuT and MicroBooNE Experiments and the Future of Liquid Argon Time Projection Chambers
- November 2013 **24th Workshop on Weak Interactions and Neutrinos (WIN2013)**,  
*Natal, Brazil.*  
Results from the ArgoNeuT Experiment
- November 2013 **Wisconsin IceCube Particle Astrophysics Center Seminar (WIPAC)**,  
*Madison, WI.*  
The MicroBooNE and ArgoNeuT Experiments and the Future of Liquid Argon Time Projection Chambers
- September 2013 **13th International Conference on Topics in Astroparticle and Underground Physics (TAUP 2013)**, *Asilomar, CA.*  
The MicroBooNE and ArgoNeuT Experiments

- July 2013 **Community Summer Study 2013 (Snowmass 2013)**, *Minneapolis, MN.*  
Snowmass Young Physicists Report
- May 2013 **Advances in Neutrino Technology (ANT2013)**, *Tahoe City, CA.*  
The LArIAT Experiment
- January 2009 **USCMS J-Term III Conference**, *Batavia, IL.*  
Searching for SUSY in the  $\text{Jet}+\text{MET}+\tau$  Final State Using the Standard Tools

## Teaching Experience

- 2012–2015 **Adjunct Professor of Physics**, *Roosevelt University, Chicago, IL.*  
Teaching responsibilities
- Preparing and administering bi-weekly introductory non-calculus based lecture material and homework (10-40 students/semester)
  - Preparing and administering bi-weekly introductory astronomy/cosmology course lecture material and homework for non-science majors (30-50 students/semester)
  - Advising and overseeing undergraduate lead research projects (1-2 students/semester)
  - Developing and maintaining a large data base of textbook questions and math quizzes in the Blackboard online environment
  - Developing new lab based material to better fit new facilities and administering weekly lab sections
- 2004–2010 **Teaching Assistant**, *Texas A&M University, College Station, TX.*  
Teaching responsibilities
- WebCT/Elearning administrator for Texas A&M Physics Department
  - Teaching Assistant for the graduate Experimental Methods and Tools course
  - Teaching Assistant for introductory calculus based physics courses
  - Teaching Assistant for introductory cosmology course

## Experiments

### Current Experiments

- MicroBooNE **Micro-Booster Neutrino Experiment**, *(2012 - Present)*.  
A  $\sim 100$  ton LArTPC located at the Booster neutrino beam-line at Fermilab that will measure low energy cross-sections and investigate the low energy excess observed by MiniBooNE[1]
- LArIAT **Liquid Argon in a Testbeam**, *(2012 - Present)*.  
A phased program is currently being executed at Fermilab for a precise calibration of the LArTPC detectors at the Fermilab Test Beam Facility
- ArgoNeuT **Argon Neutrino Test-stand**, *(2012 - Present)*.  
A small-scale LArTPC which recorded data in the NuMI beam-line at Fermilab in 2009-2010 providing the first ever data for low energy neutrino interactions within a LArTPC
- ArgonCube **Liquid Argon Cube Prototype**, *(2014 - Present)*.  
Proposed R&D experiment based at Bern University and the CERN test beam to deploy modular LArTPC's for multi-kiloton scale neutrino experiment with replaceable TPC's
- LAr1-ND **Liquid Argon Near Detector**, *(2013 - Present)*.  
Proposed experiment to deploy a  $\sim 40$  ton LArTPC as a near detector for MicroBooNE on the Booster neutrino beam-line to conclusively address the LSND oscillation anomaly [2]
- ELBNF **Experiment at the Long Baseline Neutrino Facility**, *(2012 - Present)*.  
Planned long baseline neutrino experiment conceived around a new neutrino source from Fermilab and a large underground LArTPC at the Sanford Underground Research Facility

## Past Experiments

CDF **Collider Detector at Fermilab**, (2007 - 2013).

Multi-purpose detector studying high energy particle collisions at Fermilab's Tevatron, the worlds highest energy proton-antiproton collider which ran until 2012

CMS **Compact Muon Solenoid**, (2007 - 2010).

A general-purpose detector at the Large Hadron Collider (LHC). It is designed to investigate a wide range of physics, including the search for the Higgs boson, extra dimensions, and particles that could make up dark matter

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## Technical Skills

Operating Systems	Microsoft Windows, Apple OS, Scientific and Ubuntu Linux as well as other UNIX variants
Programming Languages	C, C++, Python, FORTRAN, UNIX shell scripting, CUDA, HTML
Applications	ROOT, LArSoft, Maple, Condor, VMWare, T <sub>E</sub> X, L <sup>A</sup> T <sub>E</sub> X, B <sub>I</sub> B <sub>T</sub> E <sub>X</sub> , Microsoft Office (Word, Excel, Outlook, Powerpoint), and other common productivity packages
Teaching Applications	Blackboard/Elearning, LabVIEW, Calibrated Peer Review Online Tools (CPR), Turnitin.com (Online Plagiarism Detector)

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## References

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## Bibliography

MiniBooNE Collaboration, A. A. Aguilar-Arevalo et al., *Improved Search for  $\bar{\nu}_\mu \rightarrow \bar{\nu}_e$  Oscillations in the MiniBooNE Experiment*, Phys. Rev. Lett. 110 (2013) 161801

LSND Collaboration, A. Aguilar-Arevalo et. al., *Evidence for neutrino oscillations from the observation of  $\bar{\nu}_e$  appearance in a  $\bar{\nu}_\mu$  beam*, Phys. Rev. D64 (2001) 112007

J.Asaadi et. al., *Testing of High Voltage Surge Protection Devices for Use in Liquid Argon TPC Detectors*, Accepted to JINST August 2014) arXiv:1406.5216

B.J.P. Jones et al., *A Measurement of the Absorption of Liquid Argon Scintillation Light by Dissolved Nitrogen at the Part-Per-Million Level*, JINST 8 P07011 (2013)

J.Asaadi et. al., *Wire Plane Fabrication, Installation, and Testing for the Micro-BooNE Time Projection Chamber* (Document in preparation)

Snowmass 2013 Young Physicist Movement, <http://snowmassyoung.hep.net/>

J. Anderson et. al. *Snowmass 2013 Young Physicists Science and Career Survey Report*, SNOW13-00132, arXiv:1307.8080

Young Physicists Step Up, Symmetry Magazine, <http://www.symmetrymagazine.org/article/october-2013/young-physicists-step-up>

After the LHC, the Deluge, Science AAAS, [http://sciencecareers.sciencemag.org/career\\_magazine/previous\\_issues/articles/2013\\_08\\_29/caredit.a1300185](http://sciencecareers.sciencemag.org/career_magazine/previous_issues/articles/2013_08_29/caredit.a1300185)

CDF Collaboration: T. Aaltonen et. al., *Signature-based search for delayed photons in the exclusive photon plus missing transverse energy events from  $p\bar{p}$  collisions with  $\sqrt{s} = 1.96$  TeV*, Phys. Rev. D 88, 031103(R) (2013), arXiv:1307.0474

CMS Collaboration: *Performance of the CMS Hadron Calorimeter with Cosmic Ray Muons and LHC Beam Data*, JINST 5:T03012 (2010), arXiv: 0911.4991