

**Contact Information**

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**Education**

Ph.D. Physics, Indiana University, July 2012 (Thesis Advisor: Professor Harold G. Evans)  
*Searches for Lorentz Violation in Top-Quark Production and Decay at Hadron Colliders*  
M.S. Physics, Indiana University, August 2005  
B.A. Physics & Mathematics *summa cum laude*, Anderson University, May 2004

**Professional Experience**

2017 – present	Assistant Professor of Physics	Syracuse University
2013 – 2017	Postdoctoral Researcher	Indiana University, Bloomington
2012	Lecturer	Indiana University, Bloomington

**Awards & Recognitions**

2023	Physics Faculty Teaching Award: Outstanding Undergraduate Majors Course (PHY 226)	Syracuse U.
2023	Physics Social Justice and Community Building Award	Syracuse U.
2020	National Science Foundation CAREER Award	Syracuse U.
2018	Physics Undergraduate Teaching Award (AST 104, w/ P. Saulson)	Syracuse U.
2010	College of Arts and Sciences Dissertation Year Research Fellowship	Indiana U.

**External Sponsorship**

2022 – 2025 “Neutrino Research at Syracuse University” (NSF)  
2022 – 2025 “Neutrino Research at Syracuse University” (Department of Energy)  
2020 – 2024 “CAREER Enhancing Future Liquid Argon Neutrino Experiments with Xenon” (NSF)  
incl. MPS-High Supplement (2022), AGEP-GRS Supplement (2022)  
2020 – 2022 “Neutrino Physics at Syracuse University” (NSF)  
2020 – 2021 “Understanding and Improving NOvA Systematics with Test Beam Data” (URA)  
2018 – 2022 “DUNE Photon Detector Hardware Longevity Study” (Fermilab)

**Selected Primary Publications**

- 1) Measurement of the  $\nu_e$ -Nucleus CC Double-Differential Cross Section at  $\langle E_{\nu} \rangle = 2.4$  GeV using NOvA  
M. A. Acero et al. (NOvA Collaboration), *Phys.Rev.Lett.* 130 (2023) 5, 051802
- 2) Measurement of the Double-Differential  $\nu_{\mu}$  CC Inclusive Cross Section in the NOvA Near Detector  
M. A. Acero et al. (NOvA Collaboration), *Phys.Rev.D* 107 (2023) 5, 052011
- 3) Design, construction, and operation of the ProtoDUNE-SP Liquid Argon TPC  
A. Abed Abud et al. (DUNE Collaboration), *JINST* 17 (2022) 01, P01005
- 4) Seasonal variation of multiple-muon cosmic ray air showers observed in the NOvA detector on the surface  
M.A. Acero et al (NOvA Collaboration), *Phys.Rev.D* 104 (2021) 1, 012014
- 5) First results on ProtoDUNE-SP liquid argon time projection chamber performance from a beam test...  
B. Abi et al. (DUNE Collaboration), *JINST* 15 (2020) 12, P12004
- 6) DUNE Far Detector Technical Design Report, Volume IV: Far Detector Single-phase Technology  
B. Abi et al. (DUNE Collaboration), *JINST* 15 (2020) 08, T08010

- 7) Adjusting neutrino interaction models and evaluating uncertainties using NOvA near detector data  
M.A. Acero et al. (NOvA Collaboration), *Eur. Phys. J. C* 80, 1119 (2020)
- 8) Design and performance of a 35-ton liquid argon time projection chamber as a prototype...  
D.L. Adams, M. Baird, G. Barr, N. Barros, A. Blake, et al. *JINST* 15 (2020) 03, P03035
- 9) New Technologies for Discovery”  
Z. Ahmed, et al., e-Print: 1908.00194 [physics.ins-det]
- 10) A Novel Use of Light Guides and Wavelength Shifting Plates for the Detection of Scintillation Photons...  
B. Howard, S. Mufson, D. Whittington, B. Adams, B. Baugh, et al., *Nucl.Instrum.Meth.A* 907 (2018) 9-21
- 11) Photon Detection System Designs for the Deep Underground Neutrino Experiment  
D. Whittington, *JINST* 11 (2016) 05, C05019
- 12) Scintillation Light from Cosmic-Ray Muons in Liquid Argon  
D. Whittington, S. Mufson, B. Howard, *JINST* 11 (2016) 05, P05016
- 13) Summary of the Second Workshop on Liquid Argon Time Projection Chamber Research and Development...  
R. Acciarri, M. Adamowski, D. Artrip, B. Baller, C. Bromberg, et al., *JINST* 10 (2015) 07, T07006
- 14) Search for violation of Lorentz invariance in top quark pair production and decay  
D0 Collaboration, *Phys.Rev.Lett.* 108 (2012) 261603
- 15) Sensitivity to Lorentz Violation in the Top-quark Sector at the LHC  
D. Whittington, in Proceedings of the Fifth Meeting on CPT and Lorentz Symmetry, edited by V.A. Kostelecký (World Scientific, Hackensack, NJ 2010)

### Selected Collaboration Publications

- 1) Improved measurement of neutrino oscillation parameters by the NOvA experiment  
M.A. Acero et al (NOvA Collaboration), *Phys.Rev.D* 106 (2022) 3, 032004
- 2) Supernova neutrino burst detection with the Deep Underground Neutrino Experiment  
B. Abi et al. (DUNE Collaboration), *Eur. Phys. J. C* 81 (2021) 5, 423
- 3) First Measurement of Neutrino Oscillation Parameters using Neutrinos and Antineutrinos by NOvA  
NOvA Collaboration, *Phys.Rev.Lett.* 123 (2019) 15, 151803
- 4) The DUNE Far Detector Interim Design Report, Volume 2: Single-Phase Module  
DUNE Collaboration, e-Print: 1807.10327 [physics.ins-det]
- 5) New constraints on oscillation parameters from  $\nu_e$  appearance and  $\nu_\mu$  disappearance in the NOvA experiment  
NOvA Collaboration, *Phys.Rev.D* 98 (2018) 032012
- 6) Photon detector system timing performance in the DUNE 35-ton prototype liquid argon TPC  
DUNE Collaboration, *JINST* 13 (2018) 06, P06022
- 7) The Single-Phase ProtoDUNE Technical Design Report  
DUNE Collaboration, e-Print: 1706.07081 [physics.ins-det]
- 8) Constraints on Oscillation Parameters from  $\nu_e$  Appearance and  $\nu_\mu$  Disappearance in NOvA  
NOvA Collaboration, *Phys.Rev.Lett.* 118 (2017) 23, 231801
- 9) Measurement of the neutrino mixing angle  $\theta_{23}$  in NOvA  
NOvA Collaboration, *Phys.Rev.Lett.* 118 (2017) 15, 151802
- 10) First measurement of muon-neutrino disappearance in NOvA  
NOvA Collaboration, *Phys.Rev.D* 93 (2016) 5, 051104
- 11) First measurement of electron neutrino appearance in NOvA  
NOvA Collaboration, *Phys.Rev.Lett.* 116 (2016) 15, 151806
- 12) Long-Baseline Neutrino Facility (LBNF) and Deep Underground Neutrino Experiment (DUNE) : Conceptual Design Report, Volume 1: The LBNF and DUNE Projects  
DUNE Collaboration, e-Print: 1601.02984 [physics.ins-det]

**Full Publication List:** <http://inspirehep.net/search?p=exactauthor:Denver.W.Whittington.1>

**Invited Talks**

- “Catching Neutrinos,”  
Apr. 26, 2023, Ithaca College
- “Beyond the Baseline: Opportunities with Giant Neutrino Detectors”  
Apr. 27, 2022, University of Rochester  
Apr. 25, 2022, Idaho State University  
Apr. 8, 2022, Tufts University
- “Physics on the Horizon from the Deep Underground Neutrino Experiment”  
Oct. 8 & 14, 2021, Syracuse University Project Advance (New York City, Syracuse)  
Sep. 24, 2021, University of Utah  
Aug. 21, 2021, 54th Fermilab Users Meeting  
Feb. 21, 2020, SUNY Albany
- “Investigating Neutrino Properties with the NOvA Experiment,”  
April 20, 2018, Cornell University  
March 20, 2018, University of Rochester
- “Collecting Light from Neutrino Interactions,”  
May 25, 2017, Neutrino Seminar Series, Fermilab
- “The Scintillating Science of Long-Baseline Neutrino Experiments,”  
Feb. 23, 2017, Physics Department Colloquium, Syracuse University
- “Scintillating Science with Long-Baseline Neutrino Detectors,”  
Mar. 30, 2016, Neutrino Seminar, Boston University
- “Scintillation Detection for a Large Liquid Argon Time Projection Chamber,”  
Feb. 23, 2016, HEP Seminar, Northwestern University
- “Photon Detector Designs for the Deep Underground Neutrino Experiment,”  
Aug. 28-30, 2015, Light Detection in Noble Elements (LIDINE), SUNY U. at Albany
- “Alternative PD Design: WLS Radiator + WLS Light Guide,”  
May 19-20, 2015, DUNE Far Detector Design Review
- “Design Testing for a Large-Area Photon Detection System: Light-Collecting Paddles and SiPMs”  
July 8, 2014, LArTPC R&D 2014, Fermi National Accelerator Laboratory
- “Photon Detector Paddle, Sensor, and Readout Design”  
June 16, 2014, 35t Prototype Phase 2 Testing and Assembly Readiness Review, Physical Sciences Laboratory, U. Wisconsin-Madison
- “Development of a Photon Detection System in Liquid Argon for the Long-Baseline Neutrino Experiment”  
Dec. 11, 2013, Laboratory for Particle Physics and Cosmology, Harvard University  
Dec. 10, 2013, Department of Physics, Massachusetts Institute of Technology
- “LBNE Photon Detector Testing at TallBo”  
Oct. 28, 2013, All Experiments Meeting, Fermi National Accelerator Laboratory
- “Searching for Lorentz Violation in the Top-Quark Sector”  
June 20, 2013, Sixth Meeting on CPT and Lorentz Symmetry, Indiana University
- “Particle Physics at ATLAS: Exploring the Energy Frontier”  
2012, Advanced College Project Review Seminar (Physics), Indiana University

## Conference Presentations

“Recent Results from NOvA”

14th Conference on the Intersections of Particle and Nuclear Physics, Orlando, Florida, September 2022

“Xenon Doping of Liquid Argon”

Module of Opportunity for DUNE” Workshop, Brookhaven National Laboratory, November 2019

“Results from NOvA: Long-Baseline Neutrino and Antineutrino Flavor Oscillation”

WIN2019, the 27th International Workshop on Weak Interactions and Neutrinos, Bari, Italy, June 2019

“Recent Developments in Wavelength-Shifting Coatings for Noble Element Detectors”

New Technologies for Discovery IV: The 2018 CPAD Instrumentation Frontier Workshop, November 2018

“Scintillation from Xenon-Doped Liquid Argon”

Light Detection in Noble Elements (LIDINE) 2017, SLAC National Accelerator Laboratory

“Development of a Photon Detection System in Liquid Argon for DUNE,” APS DPF August 2015

“How can you detect a reactor-driven submarine based on a neutrino detector?”

International Neutrino Summer School 2014 / 70<sup>th</sup> Scottish Univ. Summer School in Physics

“Development of a Photon Detection System in Liquid Argon for the Long-Baseline Neutrino Expt.”

Physics in Collision XXXIV (Poster)

Neutrino 2014 (Poster)

APS April Conference 2014

“Search for Violation of Lorentz Invariance in  $t\bar{t}$  Production and Decay at the DØ Experiment”

APS April Conference 2012

“Search for Lorentz Invariance Violation in Top-Quark Production and Decay at DØ”

All DØ Meeting 2012, DØ Winter Physics Workshop 2012

“Sensitivity to Lorentz violation in the top quark sector at the ATLAS detector” (Poster)

Fifth Meeting on CPT and Lorentz Symmetry 2010

“Reconstructing boosted top decays – a window on new physics at ATLAS” (Poster)

ATLAS Physics Workshop of the Americas 2009

“Search for Exotics with Top Quark Final States,” North/South Am. ATLAS Top Meeting 2008

**Collaboration / Experiment Participation**

2013 – present	Member	DUNE Collaboration
2013 – present	Member	NOvA Experiment
2010 – 2012	Collaborator	DØ Experiment
2010 – 2012	Member	IU Center for Spacetime Symmetries
2006 – 2012	Member	ATLAS Experiment

**Recent and Ongoing Research Efforts****Graduate Research Projects**

- *Optimizing DUNE for Measuring a Neutrino Signal from a Nearby Supernova*  
Sierra Thomas, Doctoral Research Project
- *Demonstration of Neutrino Oscillations Analogized to Laser Interference in a Birefringent Rod*  
Hilary Utaegbulam, Independent Study Research Project (Spring 2021)
- *Transport of Scintillation Light through Xenon-Doped Liquid Argon and its Impacts on Proton Decay Limits at the Deep Underground Neutrino Experiment*  
Kyle Spurgeon, Doctoral Dissertation, Defended June 2022
- *Analysis of the NuMI Neutrino Beam and Fermilab Test Beam with the NOvA Detectors*  
Abhilash Yallappa Dombara, Doctoral Dissertation, Defended May 2022

**Undergraduate Research Projects**

- *Optimizing Optical Properties of an Opaque Water-Based Liquid Scintillator for a Novel Neutrino Detector*  
Nathan Magers, Presented at the SU Undergraduate Research Festival (April 2023)
- *Prototyping and Data Collection with the SciMAD Cosmic Ray Detector*  
Daniel Paradiso, Presented at the SU Undergraduate Research Festival (April 2022)
- *Near-UV Scattering and Absorption by Nanoparticle Suspensions for a Novel Liquid Scintillator Detector*  
Nathan Magers, Poster at the SU Undergraduate Festival (April 2022)
- *Simulation of Photon Emission in Xenon-Doped Liquid Argon*  
Tighe Gugerty, Independent Study Research Project (Summer – Fall 2021)

**Personal Research Projects**

- *Development of a Novel Opaque Water-Based Liquid Scintillator for Neutrino Detection*
- *Distribution of Extremely High Multiplicity Muon Air Showers from Cosmic Rays with the NOvA Far Detector*
- *Searching for Muon-Neutrino Quasi-Elastic Charged-Current Lambda Production at the NOvA Near Detector*

**Professional Service and Public Outreach**

2023	International Scientific Committee Member, LIDINE 2023 Conference	Madrid
2023	Organizing Faculty Member, SU Research in Physics (SURPh) program	Syracuse U.
2022	International Scientific Committee Member, LIDINE 2022 Conference	U. of Warsaw
2022	Organizing Faculty Member, SU Research in Physics (SURPh) program	Syracuse U.
2022	Graduate Admissions Committee	Syracuse U.
2021 –	Experiencing Physics Course Development Committee Member	Syracuse U.
2021	Organizing Committee Member, LIDINE 2021 Conference	UC San Diego
2020 –	Undergraduate Curriculum Committee (Physics)	Syracuse U.
2020 – 2023	Equity, Diversity, and Inclusion Committee Member (Physics)	Syracuse U.
2019 – 2021	Colloquium Committee Member (Physics)	Syracuse U.
2019	Organizing Committee Member, LIDINE 2019 Conference	Manchester U.
2018 – 2021	Co-convenor, Photon Collection Working Group	DUNE
2017 –	Institute Board Representative for Syracuse U.	NOvA
2017 –	Analysis & Pub. Review Comm. – $\nu_\mu$ CC $\pi^0$ inclusive diff. cross section	NOvA
2017	Organizing Committee Co-Chair, LIDINE 2017 Conference	SLAC
2016 – 2017	Speakers Committee Member	DUNE
2015 – 2017	Institute Board Representative for Young DUNE	DUNE
2015 – 2017	Convener, Photon Detector Sim and Reco Working Group	DUNE
2015	Organizing Committee Member and Fellowship Coordinator, LIDINE 2015	SUNY (Albany)
2014	Photon Detection Co-Chair, 2014 LArTPC R&D Workshop	Fermilab
2010 – 2011	Physics & Astronomy Open House Planning Committee	Indiana U.
2010 – 2011	Physics Outreach Committee	Indiana U.
2010 – 2011	Physics Undergraduate Curriculum Committee	Indiana U.
2009 – 2011	Undergraduate Physics Club graduate student mentor	Indiana U.
2008 – 2009	Software Development and Commissioning Co-coordinator, TRT	ATLAS

**Teaching Experience**

2023 Spring	PHY 226 Experiencing Physics 2
2022 Fall	PHY 221 General Physics Laboratory I
2022 Fall	PHY 690 Ind. Study “Neutrinos from a Nearby Core-Collapse Supernova” (S. Thomas)
2021 Fall	PHY 250 Physics Journal Workshop
2021 Spring	AST 104 Stars, Galaxies, and the Universe (w/ S. Ballmer)
2021 Spring	PHY 690 Ind. Study “Demonstrating Neutrino Oscillation Phenomena” (H. Utaegbularm)
2020 Fall	PHY 312 Relativity & Cosmology
2020 Spring	AST 104 Stars, Galaxies, and the Universe (w/ S. Bassler)
2019 Fall	PHY 312 Relativity & Cosmology
2019 Spring	AST 104 Stars, Galaxies, and the Universe (w/ P. Saulson)
2018 Fall	PHY 351 / PHY 651 Modern Instrumentation (w/ S. Ballmer)
2018 Fall	CAS 101 First-Year Forum
2018 Spring	PHY 690 Ind. Study “VUV Spectroscopy for Liquid Argon Detectors” (K. Spurgeon)
2018 Spring	PHY 690 Ind. Study “Multivariate Analysis of Neutrino Interactions” (A. Yallappa-Dombara)
2018 Spring	PHY 312 Relativity & Cosmology
2017 Fall	PHY 690 Ind. Study “Introduction to Neutrino Physics” (A. Yallappa-Dombara)
2012	P150 “How Things Work” (Indiana U.)

**Research Mentorship**

## Graduate Students

2023 –	Graduate Research Advisor, Aklima Khanam	Syracuse U.
2022 –	Graduate Research Advisor, Sierra Thomas	Syracuse U.
2018 – 2022	Graduate Research Advisor, Kyle Spurgeon	Syracuse U.
2018 – 2022	Graduate Research Advisor, Abhilash Yallappa-Dombara	Syracuse U.
2016 – 2017	Graduate Research Mentor, Micah Groh	Indiana U.
2014 – 2017	Graduate Research Mentor, Bruce Howard	Indiana U.
2014 – 2017	Graduate Research Mentor, Chris Macias	Indiana U.

## Undergraduate Students

2023 –	Undergraduate Research Supervisor, Sahana Anand	Syracuse U.
2023 –	Undergraduate Research Supervisor, Iving Yang	Syracuse U.
2023 –	Undergraduate Research Mentor, Nicholas Rubayiza	Syracuse U.
2023 –	Undergraduate Research Mentor, Katie Smith	Syracuse U.
2022 – 2023	Undergraduate Research Supervisor, Nathan Magers	Syracuse U.
2021 – 2022	Undergraduate Research Supervisor, Daniel Paradiso	Syracuse U.
2021	Undergraduate Research Supervisor, Tighe Gugerty	Syracuse U.
2016	Undergraduate Summer Research Supervisor, Robert Smart	Indiana U.
2014 – 2016	Undergraduate Research Mentor, Johnathon Lowery	Indiana U.
2010	Undergraduate Research Mentor, Ben Weinert	Indiana U.

## High School Students

2023	Summer Research Supervisor, Nadine Arnold	Syracuse U.
2023	Summer Research Supervisor, Maria Mohamed	Syracuse U.
2022	Summer Research Supervisor, Iving Yang	Syracuse U.
2022	Summer Research Supervisor, Cole Reitzel	Syracuse U.