

# Christopher L Duston

Assistant Professor of Physics

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## Education

Ph.D. Physics, Florida State University, 2013.

*Committee:* M. Marcolli (chair), L. Reina, O. Vafek, E. Klassen (FSU Math), H. Prosper, E. Aldrovandi (FSU Math), E. Hironaka (FSU Math).

*Dissertation Title:* Exotic Smoothness, Branched Covering Spaces, and Quantum Gravity.

M.S. Physics, Florida State University, 2009.

M.S. Astronomy and Astrophysics, Pennsylvania State University, 2007.

*Committee:* R. Ciardullo (chair), S. Sigurdsson, R. Wade.

*Thesis Title:* Blue Stragglers and the Planetary Nebula Luminosity Function.

B.S. Astrophysics, University of Massachusetts, 2005.

*Minors:* Physics, Mathematics, Music.

*Honors:* *Magna Cum Laude*, Commonwealth College Honors Student (adviser D. Wang).

*Thesis Title:* Discrete Point Sources in the Chandra Galactic Center X-ray Survey.

## Academic Experience

### *Merrimack College, Department of Physics*

Assistant Professor of Physics (2016-present). Courses taught: *Physics I, Physics II, General Physics II, Analytical Mechanics.*

Term Assistant Professor of Physics (2014-2016).

### *The Expert TA Online Physics Grading System*

Content Director (2013-present). Responsible for reviewing solutions, developing constructive student feedback, writing new problems, and organizing initiatives.

### *Stony Brook University, Department of Astronomy and Physics*

Visiting Scholar (2013-2014)

*Florida State University, Department of Physics*

Research Assistant, Matilde Marcolli (2008-2013).

Teaching Assistant: *College Physics A (Studio), General Physics A (Studio), College Physics A Lab, Physics of Light and Sound, Classical Mechanics (grad.), Quantum Field Theory A (grad.), Introductory Astronomy Laboratory*

*Pennsylvania State University, Astronomy and Astrophysics Department*

Research Assistant, Robin Ciardullo (2006-2007).

Teaching Assistant: *Elementary Astronomy Laboratory*

*University of Massachusetts, Astronomy Department*

Research Assistant, Danial Wang (2004-2005).

Research Assistant, Min Yun (Summer 2003).

## Research

*Publications*

Duston C L, *Using Cosmic Strings to Relate Local Geometry to Spatial Topology*, International Journal of Modern Physics D, 1750033, arXiv:[gr-qc]/1506.00498.

Duston C L, *The Experimental Verification of Mathematics via an Axiom of Measurement*, Entry in 2015 FQXi Essay Competition

Duston C L, *Topspin Networks and Topology in Loop Quantum Gravity*, The Thirteenth Marcel Grossmann Meeting. March 2015, 2177-2179

Duston C, *The Fundamental Group of a Spatial Section Represented by a Topspin Network* arXiv:[gr-qc]/1308.2934.

Duston C, *Semiclassical Partition Functions for Gravity with Cosmic Strings*, Class. Quantum Grav. 30 (2013) 165009.

Duston C, *Topspin Networks in Loop Quantum Gravity*, Class. Quantum Grav. 29 (2012) 205015.

Duston C, *Exotic Smoothness in Four Dimensions and Euclidean Quantum Gravity*, International Journal of Geometric Methods in Modern Physics, 8(3), 2011.

*Presentations*

*Branched Covering Spaces and Partition Functions in Quantum Gravity: A Geometrization of the Gravitational Field* at the First Herman Minkowski Meeting, Albena, Bulgaria, June 2017.

*An Interactive Approach to Introductory Physics at Merrimack College*, with C. Looney, American Association of Physics Teachers Conference at Wesleyan University, October 2016.

*Exotic Smoothness and Geometric Degrees of Freedom: Surfaces, Strings, and Spinors*, 21st International Conference on General Relativity and Gravitation, Colombia University, New York, July 2016.

*Local Geometry, Global Topology, and Cosmic Strings*, 19th Eastern Gravity Meeting, Durham, NH, May 2016

*Spacetime Topology from Cosmic Strings and Foliations*, APS April Meeting, Baltimore, MD, April 2015.

*Studying Topology with Topspin Networks*, LOOPS<sub>13</sub>, Perimeter Institute, July 2013.

*Complete Semiclassical Partition Functions and Cosmic Strings*, 79th SESAPS, November 2012.

*Topspin Networks in Loop Quantum Gravity* (invited talk), 13th Marcel Grossmann Meeting, Stockholm, Sweden, July 2012.

*Topological Issues in (Loop) Quantum Gravity*, FSU Nuclear Physics Seminar, March 2012.

*Exotic Smoothness in Four Dimensions*, 6th Gulf Coast Gravity Meeting, Boca Raton, Florida, USA, May 2011.

*Exotic Smoothness in Euclidean Quantum Gravity*, 19th International Conference on General Relativity and Gravitation, Mexico City, Mexico, July 2010.

*Exotic Smoothness and Euclidean Quantum Gravity in Four Dimensions*, FSU-UF High Energy Physics Meeting, Gainesville, Florida, USA, April 2010.

*Exotic Smoothness, Physics, and Geometry*, FSU Mathematics Club, Tallahassee, Florida, USA, October 2009.

## Seminars

First Erlangen Fall School on Quantum Geometry, Erlangen, Germany, Fall 2012 (participant).

Group Theory in Particle Physics, FSU Physics Department, Fall 2011-Spring 2012 (presenter/participant).

Noncommutative Geometry, FSU Mathematics Department, Spring 2010-Fall 2011. Presented on:

*The Spectral Action and the Noncommutative Standard Model*

*Noncommutative Geometry and Loop Quantum Gravity*

*Statistical Mechanics and the Bost-Connes System*

*Seiberg-Witten Theory*

Higgs Physics, FSU Physics Department, Spring 2011. Presented on *Decays of Standard Model Higgs*.

Effective Field Theory, FSU Physics Department, Spring 2010 (participant).

## Reviewing

*Physics of the Dark Universe*, Elsevier (2017)

*Classical and Quantum Gravity*, International Institute of Physics (2014-2017)

*The Physics Teacher*, AAPT (2016-2017).

## Professional Associations

American Physical Society (APS)

American Association of University Professors (AAUP)

International Society of General Relativity and Gravitation (ISGRG)

## Honors, Awards, & Fellowships

Merrimack Faculty Development Grant, 2017-2018.

Merrimack Mobile/CETL Grant for 1-1 iPad use, Spring 2015

FGSA Travel Award for Excellence in Graduate Research, 2013

Teaching Assistant of the Year, Pennsylvania State University, 2007.

Braddock/Roberts Fellowship, Pennsylvania State University, 2005.

David van Blerkom Undergraduate Research Scholarship, University of Massachusetts, 2003.

Last updated: October 12, 2017