

# Jason T. Barkeloo

PARTICLE PHYSICS, DATA ANALYSIS, MACHINE LEARNING

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## Education

### University of Oregon

DOCTORATE OF PHILOSOPHY IN PHYSICS

Eugene, OR

June 2020

- **Dissertation:** Search for the Flavor Changing Neutral Current,  $t \rightarrow q\gamma$ , in Top Pair Events Using the ATLAS Detector
- **CERN (European Organization for Nuclear Research)**, Geneva, Switzerland — July 2016- July 2017

### Miami University

MASTER OF SCIENCE IN PHYSICS

Oxford, OH

May 2012

- **Thesis:** Investigation of Electromagnetically Induced Transparency and Absorption in Warm Rb Vapor by Application of a Magnetic Field and Co-propagating Single Linearly Polarized Light Beam

### Wittenberg University

BACHELOR OF SCIENCE IN PHYSICS

Springfield, OH

May 2010

- **Thesis:** Computational Modeling of Boron-8  $\beta$ -Decay Spectroscopy

## Experience

### DATA ANALYSIS

- Solo analyzer searching for very rare physics processes in one of the world's largest datasets
- Improved experimental reach by 30% through the design, optimization, and implementation of a neural network for signal-background discrimination
- Mined over 100 TB of ATLAS data to search for indications of rare processes using a C++ framework and distributed computing
- Successfully implemented multiple data-driven background techniques for more accurate Monte Carlo modeling

### SOFTWARE REPROCESSING EXPERT

- Developed and maintained infrastructure for large scale software validation following the Agile Software Development model
- Implemented tag-and-probe methods to develop monitoring algorithms for the ATLAS detector

### DETECTOR MODELING AND OPTIMIZATION

- Developed Monte Carlo simulations for comparison to real world test beam studies
- Cost optimization of the electromagnetic calorimeter for the future International Linear Collider using machine learning methodologies

### OTHER EXPERIENCE

- Constructed cost effective laser and amplifier systems for research and teaching scenarios
- Teaching assistant at both the University of Oregon and Miami University, improving communication and education skills

## Select Publications

### Correcting for Leakage Energy in the SiD Silicon-Tungsten ECal

March 2020

ARXIV:2002.04100 [PHYSICS.INS-DET]

### A Silicon-Tungsten Electromagnetic Calorimeter with Integrated Electronics for the International Linear Collider

January 2019

J. PHYS.: CONF. SER. **1162** 012016

### 282 additional publications as a member of the ATLAS Collaboration

May 2017 - present

## Skills

<b>Computing and Software</b>	Python, C++, Mathematica, MATLAB, Linux, Git, Rucio, Windows Office Suite, $\text{\LaTeX}$ , GIT, JIRA, TWIKI
<b>Frameworks and Libraries</b>	Pandas, Numpy, Scikit-learn, Keras, Matplotlib, ROOT Data Analysis Framework
<b>Competencies</b>	Big Data, Machine Learning, Data Analysis, Algorithm Development, Data Visualization, Applied Physics