

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 β -Decay Spectroscopy

Experience

DATA ANALYSIS

- Main analyzer searching for very rare physics processes in one of the world's largest datasets
- Improved experimental reach by 30% through the creation 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 validated Monte Carlo simulated data through the design and implementation of a background-rich data region

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 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

279 publications as a member of the ATLAS Collaboration

May 2017 - present

Skills

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