Jason T. Barkeloo

Particle Physics, Data Analysis, Machine Learning

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Education

University of Oregon — *Eugene, OR*

Doctorate of Philosophy in Physics — *June 2020*

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

Miami University — *Oxford, OH*

Master of Science in Physics — *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 — *Springfield, OH*

Bachelor of Science in Physics — *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 20% 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