Reed Hodges

reed.hodges@duke.edu
https://reedhodges.github.io/

Education

Ph.D. in Physics, Concentration: Theoretical Nuclear/Particle Physics
Duke University, expected 2024

B.S. in Physics, Minor: Mathematics
Georgia Southern University, 2018

Relevant Experience

Graduate Research Assistant, QCD Theory Group

Duke University / Durham, NC / 2018-present
Advisor: Thomas Mehen

- Adapted models to make qualitative and quantitative predictions for the results of experiments at particle colliders
- Wrote programs to test models and hypotheses via numerical computation and data visualization
- Derived new formulae that describe how particles can fragment and create different particles, utilizing a combination of mathematical calculations and simplification in a computer program
- Collaborated as part of global research teams spanning multiple organizations, playing a key role in research, writing, and presentation
- Published papers in top-ranked journals, contributing to cutting-edge research areas in nuclear/particle physics
- Delivered presentations of research findings at regional, national, and international conferences, engaging with academic peers and contributing to the broader discourse in the field
- Contributed as a member of the HEFTY Collaboration, a theoretical nuclear physics research collaboration funded by the U.S. Department of Energy

Graduate Teaching Assistant

Duke University / Durham, NC / 2018-2021

- Translated complex physics concepts into clear, understandable terms for students
- Modeled and taught best practices in scientific data collection, ensuring accuracy and reliability, while encouraging a data-driven mindset and approach among students
- Provided comprehensive instruction on utilizing specialized data collection software, enabling students to gather and manage data efficiently and accurately

- Engaged in regular data entry and management tasks, ensuring accuracy and integrity of student records and performance metrics

Undergraduate Research Assistant, Computational Nanotechnology Group
Georgia Southern University / Statesboro, GA / 2015-2018
Advisor: Maxim Durach

- Developed and executed computer programs to model and understand how special micrometer-sized materials interact with light
- Conducted research and iterative testing to identify a design of a micrometer-sized sphere that has near-invisibility when exposed to light
- Optimized code for efficiency and performance to meet high computational demands
- Published papers in peer-reviewed journals and presented research findings at regional and national conferences

Blue Waters Petascale Computing Intern
Shodor Education Foundation / 2016-2017

- Completed an intensive educational program on parallel computing at the National Center for Supercomputing Applications, where I gained knowledge on parallel programming interfaces such as OpenMP, MPI, and CUDA
- Applied parallel computing techniques to optimize my undergraduate research simulations, achieving significant improvements in computational speed
- Gained practical experience with the Blue Waters supercomputer, enhancing research outcomes through high-performance computing

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Languages

Python, C, Fortran, R, HTML

Software, Applications, & Development Tools

Github, Pandas, Numpy, Linux/Unix, Mathematica, LaTeX, MATLAB, Microsoft Suite

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Skills

Analytical Thinking, Problem Solving, Data Analysis, Data Visualization, Critical Thinking, Collaboration, Project Management, Research Skills, Communication, Technical Writing, Adaptability, Presentation Skills, Teamwork, Mentoring, Learning Agility, Creativity, Public Speaking