

DAVID ANDREW MULLINS

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SUMMARY

Physics PhD candidate and high-performance software engineer specializing in low-latency C++ infrastructure and high-dimensional statistical modeling. Interested in applying rigorous scientific methods, time-series analysis, and large-scale data engineering to real world problems.

EDUCATION

Bachelor of Science in Physics
University of Kentucky, GPA: 3.95

August 2014 - May 2018

PhD Physics (In progress)
University of Kentucky, GPA: 3.65

May 2022 - Present

TECHNICAL SKILLS

Programming Languages	C++, Python, SQL
Libraries and Frameworks	ROOT, Qt5, Boost, CUDA, Pandas, Numpy, Scipy
Tools and Infrastructure	FPGA Development, High Performance Computing, Linux, Git
Quantitative Methods	Linear Algebra, High Dimensional Statistical Modeling, Time Series Analysis, Monte Carlo Methods, Finite Element Analysis

AWARDS

SC-GSR – Oak Ridge National Lab, Oak Ridge, TN
Fulbright Research Grant – Bern, Switzerland

November 2025 - Present
Aug 2018 - July 2019

EXPERIENCE

DAQ Development for Nab Experiment
ORNL – Oak Ridge, TN

May 2022 - Present

- Developed and deployed real-time statistical algorithms (least squares regression to arbitrary piecewise polynomials) on FPGA hardware to minimize latency in data acquisition.
- Designed and optimized high-performance host software in C++ to interface with custom firmware, improving overall system performance.
- Developed a distributed C++ data architecture deployed on super computing clusters to ingest 80+ TB of raw data, enabling the optimization of a high-dimensional statistical model.

Software Engineer
Blue Ink Tech – Huntington, WV

May 2021 - May 2022

- Engineered and maintained a real-time, event-driven C++ (Qt5) application to process and validate continuous streams of edge-device telemetry data.
- Developed robust data pipelines interfacing the C++ client with external web APIs and a PostgreSQL backend to ensure highly reliable, asynchronous data synchronization.

Fulbright Researcher
University of Bern – Bern, Switzerland

Aug 2018 - Jul 2019

- Performed finite element simulations to model complex electrode systems, optimizing geometric parameters to achieve a 30% measurable increase in system performance and stability.
- Deployed robust, automated data acquisition software to streamline real-time data collection pipelines and manage remote interactions across distributed system components.

Student Researcher
National Institute of Standards and Technology – Gaithersburg, MD

May 2017 - Aug 2018

- Engineered data pipelines and algorithms to process TB scale image data sets taken at the NIST Center for Neutron Research using a neutron camera into 3D models that reveal the inner structure of the sample.
- Designed and implemented custom software solutions to extract actionable signals from high-noise environments.

PUBLICATIONS

Ultracold neutron energy spectrum and storage properties from magnetically induced spin depolarization <i>n2EDM Collaboration</i> – Accepted to PRL (pending)	Apr 2026
First Full Dalitz Plot Measurement in Neutron Decay using the Nab Spectrometer and Implications for New Physics <i>Nab Collaboration</i> – Phys. Rev. C 113, 035501	Mar 2026
The design of the n2EDM experiment <i>n2EDM Collaboration</i> – Eur.Phys.J.C 81 (2021) 6, 512	Jun 2021