Michael Schott

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Data Scientist

Data Visualization | Experimental Data Analysis | Statistical Modeling

Research-driven physicist with experience translating complex experimental data into scalable analysis pipelines, statistical models, and software frameworks supporting high-stakes scientific decision making. Possess expertise in data analysis, C++ and Python development, machine learning integration, and Linux-based computing environments spanning international collaboration. Skilled in structuring blinded analysis workflows, selection bias mitigation, and maximum likelihood modeling. Design and implement end-to-end ETL-style pipelines, data visualizations, and version-controlled codebases.

Core Competencies

- Large-Scale Dataset Processing
- Extrapolation Techniques
- Hypothesis Testing
- ETL Pipeline Design
- Uncertainty Quantification
- Bias Mitigation Techniques
- Research & Development
- Signal & Background Discrimination
- Maximum Likelihood Estimation

Education

Ph.D., Physics ▪ University of Arizona – Tucson, AZ ▪ January 2025

- Dissertation: Search for Long-Lived Particles Decaying Into Displaced Hadronic Jets in the Muon Spectrometer in pp Collisions at √S = 13 TeV with the ATLAS Detector
- Coursework: Analytical Mechanics | Quantum Mechanics (A and B) | Electromagnetic Theory (A and B) | Statistical Mechanics Continuum Mechanics | Digital Electronic Techniques | Techniques in Particle Physics | Elementary Particle Physics Advanced Relativistic Quantum Mechanics I | Tools of Theoretical Astrophysics | Methods in Computational Astrophysics
- Served as teaching assistant for four years. Delivered lectures, recitations, and laboratory instruction across multiple physics courses to sections of 20 to 30 students.

Bachelor of Science (B.S.), Physics ▪ University of Cincinnati – Cincinnati, OH ▪ April 2016
Bachelor of Arts (B.A.), Mathematics ▪ University of Cincinnati – Cincinnati, OH ▪ April 2016

- Coursework: Calculus (I, II) | Multivariable Calculus | Linear Algebra | Differential Equations | Probability and Statistics I Partial Differential Equations & Fourier Analysis | Mathematical Modeling | Electricity and Magnetism (I, II) Thermodynamics & Statistical Physics | Intermediate Mechanics | Quantum Mechanics (I, II) | Physics Capstone Project

Professional Experience

UNIVERSITY OF ARIZONA, DEPARTMENT OF PHYSICS – Tucson, AZ August 2018 to December 2024

Research-focused department that conducts experimental and theoretical work across high-energy physics, astrophysics, condensed matter, and nuclear physics, with participation in large-scale international collaborations and federally funded research programs.

Ph.D. Research – Experimental Particle Physics

Conducted experimental particle physics research within ATLAS Collaboration focused on searches for long-lived particles using proton–proton collision data collected during Run 2 of Large Hadron Collider. Work centered on large-scale data analysis, statistical modeling, and software framework development supporting blinded analyses and exclusion limit determination. Evaluated ONNX framework and provided architectural recommendations for future implementation. Prepared technical documentation describing analysis methodology, selection logic, statistical models, and validation procedures for internal review.

- **Designed, implemented, and maintained end-to-end data analysis and selection pipelines** processing large-scale collision datasets using C++ and ROOT frameworks.
- Served as primary author and maintainer of **core selection framework, defining, modifying, and validating selection criteria.**
- **Applied selection criteria across full Run 2 dataset;** utilized signal-like events based on displaced vertex signatures.
- **Executed blinded analysis workflows** incorporating bias mitigation and systematic uncertainty handling.
- **Performed maximum likelihood statistical modeling** to derive upper-limit exclusion ranges at 95% confidence level.

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- **Owned and administered GitLab repository for selection framework source code;** managed version control and integration workflows across collaboration.
- **Integrated additional software tools and packages into analysis framework** based on collaboration needs.
- **Developed data visualizations, plots, and tables,** supporting technical review, troubleshooting, and collaborative discussion.
- **Rewrote data selection pipeline from Python to C++,** including architectural redesign and execution flow optimization.
- **Integrated machine learning inferencing into analysis pipeline using Keras and TensorFlow** via introducing Lightweight Trained Neural Network library.
- **Contributed to migration of Athena trigger** to updated ATLAS software framework, including rewrite and validation activities.
- **Collaborated with international research teams across multiple institutions and time zones.** Presented weekly technical updates to collaborators.
- Presented research findings in **public dissertation defense and internal collaboration forums.**
- **Used VS Code for local and remote development** within Linux-based computer environments.

ST. XAVIER HIGH SCHOOL – Cincinnati, OH January 2025 to June 2025

Catholic college preparatory secondary school serving 1,200 students with 120 full-time faculty, delivering Jesuit education focused on academics, character formation, and college readiness.

Long-Term Substitute Physics Instructor

Delivered rigorous secondary physics instruction focused on conceptual mastery across gravitation, electromagnetism, wave behavior, sound, and optics while adapting content delivery to varied learning needs. Designed and taught 4 course sections serving 97 students, including learners with IEPs and 504 plans, using multi-modal instruction blending lecture, laboratory experimentation, independent work, and small-group collaboration.

- **Designed and launched original student research and infographic project** using Canva, Makerspace printing resources, Microsoft Forms QR-code, and multi-stage feedback checkpoints, **resulting in 65 completed posters displayed in school common spaces.**

Additional Training

More than MFG Expo | April 2026
Solutions That Matter Seminar | Baker and Associates | August 2025
6th ATLAS Machine Learning Workshop | January 2023
US ATLAS CAMPFIRE Workshop | June 2019

Technical Skills

Programming Languages & Scripting:	Python, C++, Bash
Machine Learning & AI Frameworks:	TensorFlow, Keras, PyTorch, scikit-learn, ONNX, lwtnn
Python Libraries & Packages:	NumPy, Matplotlib, SciPy, Pandas, pickle
C++ Libraries & Frameworks:	Boost, ROOT (Data Analysis & Statistical Modeling)
Version Control & Source Management:	Git, GitHub, GitLab
Development Environments & IDEs:	VS Code, Atom
Operating Systems:	Windows 10 and 11, Ubuntu, Red Hat Enterprise Linux, CentOS, AlmaLinux OS, WSL, WSL2
Remote Access & Systems Tools:	SSH, SCP
Design & Visualization Tools:	GIMP, Inkscape, Canva
Hardware Description Languages:	Verilog (familiar), VHDL (familiar)
Productivity Software:	Microsoft Office Suite, Microsoft Teams, Google Workspace, Slack, Zoom

Achievement/Honor

Eagle Scout – Troop 621, Loveland, OH