Dr. Giordon Stark — *"jack of all trades, physicist of one"*

Contact Information

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Publication list (500+ papers)
curriculum vitae

Summary

- Particle physicist on the ATLAS detector at CERN looking to transition to the private sector.
- "Big data scientist" analyzing petabytes of collisions for signs of new physics.
- Passionate about building reusable, robust, containerized data analysis pipelines, creating actionable data products, and developing software to improve user experience.

</> Highlighted Projects

- pyhf— statistics | GPU | numpy | scipy | tensorflow | jax | pytorch | auto-diff
  Created a python-only hypothesis testing framework which speeds up asymptotic statistical fits by a few orders of magnitude, using tensor algebra libraries such as `jax` and `pytorch`.
- GitLab CI/CD Training— gitlab | tutorial | continuous integration | python | C++
  Produced a three-hour tutorial using GitLab CI/CD with closed-captioned YouTube videos aimed at teaching physicists how to develop testable and reproducible analyses.
- itkdb— python | betamax | requests | unit tests | integration tests | mongodb
  Developed a user-friendly python interface to a quasi-RESTful API used to register, test, and ship millions of detector components for the ATLAS detector upgrade in 2028. This speeds up custom tooling needed by third-party vendors for interacting with the database.
- gFEX— FPGA | firmware | embedded OS | cross-compilation
  Collaborated with a team of physicists and engineers to design a single PCB to process 40 TB/s of raw data from the detector. Pioneered the embedded processor firmware currently in use.
- labRemote— pybind11 | python | C++ | CI/CD | wheels
  Wrote the python-bindings for a C++ framework that slow-controls laboratory hardware, and enhanced the CI/CD to deploy pre-built, relocatable binaries to make it easier for technicians and users to install.

Work History

SCIPP, Santa Cruz, California — **August 2018 – 2026**
Post-doctoral Researcher (2018-2024), Project Scientist (2024-2026), ATLAS Experiment at CERN

- IRIS-HEP Project Scientist - contributing to scalable algorithms, data management, and high-performance analysis systems to meet the software and computing challenges of high energy particle physics
- Led the effort within the 5000-person collaboration to adopt GitLab CI/CD for analysis development, paper publication, and documentation.
- Coordinated HPC resources for generating billions of Monte Carlo events for physics analyses
- Organized and instructed in software tutorials for hundreds of physicists.
- Built up the hardware, firmware, front-end, and back-end infrastructure for testing and qualifying CMOS-based electronic chips for the instrumentation upgrade of the ATLAS charged particle tracking detector for the next decade.
- Developed tooling and infrastructure to support the next-generation of data products published by physics collaborations, improving communication with theorists.

UChicago, Chicago, Illinois — **August 2012 – July 2018**
Graduate Research Scientist

- Migrated the 500k+ LOC C++ offline analysis project from SVN to Git and made it public.
- Collaborated with engineers on instrumentation design for the upgrade of the ATLAS detector real-time hardware-based decision-making system to process 40 TB of data every second.
- Developed and maintained a user-friendly C++ analysis framework for physics across multiple domains including Standard Model, searches for new physics, and calibrations.
- Came up with the innovative strategy to use OpenEmbedded firmware layer in hardware instrumentation which paved the way for embedded processor design in High Energy Physics

Education

Ph.D. **University of Chicago**, Chicago, Illinois — **September 2012 – July 2018**
The search for supersymmetry in hadronic final states using boosted object reconstruction

B.S. **California Institute of Technology**, Pasadena, California — **September 2008 – June 2012**
Optical Coating Brownian Thermal Noise in Gravitational Wave Detectors