

Dr. Giordon Stark

CONTACT INFORMATION

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📄 [Publication list \(500+ papers\)](#)
📄 [curriculum vitae](#)

SUMMARY

- Jack of all trades, postdoc of one.
- Experimental 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 – present

Post-doctoral Researcher, ATLAS Experiment at CERN

- 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

University of Chicago, Chicago, Illinois

📅 **September 2012 – July 2018**

Ph.D. Physics, David Miller

🔗 [*The search for supersymmetry in hadronic final states using boosted object reconstruction*](#)

ISBN: 978-3-030-34548-8

California Institute of Technology, Pasadena, California

📅 **September 2008 – June 2012**

B.S. Physics, Kenneth Libbrecht and Harvey Newman

🔗 [*Optical Coating Brownian Thermal Noise in Gravitational Wave Detectors*](#)