

Firmware Engineer/Research Scientist Position at the University of Colorado Boulder

The University of Colorado experimental High Energy Physics group has an available position for a Research Scientist to work with the CMS experiment at the LHC. The CU CMS group is involved in a broad range of activities including detector and electronics R&D directed toward the planned upgrades of the experiment over the next decade. The current opening is to work on the Phase 2 upgrade of the trigger and data acquisition system for the High Luminosity LHC upgrade. The successful candidate will contribute to the development of a hardware trigger based on the CMS silicon tracker. The trigger system consists of ATCA boards communicating with high speed optical fibers and using FPGA processors. The candidate will contribute to the design, implementation, testing, construction, and operation of the trigger system, including logic implemented in firmware and software modelling and monitoring tools.

Required qualifications include the following:

- Experience in FPGA firmware development and simulation (Verilog and/or VHDL)
- Experience operating and maintaining hardware with state-of-the-art FPGAs
- Strong analytical skills as applied to solving engineering problems
- Ability to work collaboratively with other engineers and physicists as well as students and postdoctoral researchers

Additional preferred qualifications include the following:

- Experience with high-speed optical links
- Experience with FPGA frameworks and integrating algorithms
- Experience with Xilinx Vivado high level synthesis (HLS) tools
- Experience with modern particle detectors and data analysis techniques
- Experience with detector simulations and trigger algorithm development
- Ability to design and implement online DAQ and detector monitoring systems

Candidates should possess a Ph.D. in physics or electrical engineering, or a bachelor's degree with significant post-degree experience. This position could be filled by a qualified/experienced electronics engineer with an interest in joining a scientific research project, or by a hardware-oriented physicist who wishes to pursue a career in detector systems development. The successful candidate will be hired as either a Professional Research Assistant or a Research Associate, with the latter appropriate for a candidate with a Ph.D. Both titles imply a career research position without a fixed term, subject to availability of funding. Salary will be commensurate with qualifications and experience. CU offers a comprehensive benefits package including medical insurance, paid time off, and generous retirement contributions. The successful candidate will be based in either Boulder, Colorado or the CERN laboratory in Geneva, Switzerland, subject to the interests and expertise of the candidate. Travel to Boulder/CERN, Fermilab, and other collaborating institutions should be expected. For questions or further information please contact Prof. Keith Ulmer keith.ulmer@colorado.edu.

Interested candidates should submit a cover letter, CV, statement of technical and research experience, and contact information for at least three references through the CU portal here: <https://jobs.colorado.edu/jobs/JobDetail/?jobId=28943>. Review of applications will begin on March 31, 2021 and will continue until the position is filled.