

Job Summary

To contribute to the creation of knowledge, primarily by developing CMOS sensors and upgraded ATLAS tracker components as part of the particle physics group's commitment to AIDA-2020 and the development of silicon strip modules for the upgraded ATLAS experiment at the CERN Large Hadron Collider.

Main Duties

The duties of this post are to help coordinate testing of new CMOS-based sensors for particle physics applications within the AIDA-2020 project, and to support the construction of the upgraded tracking detectors for the ATLAS experiment.

Within AIDA-2020, Birmingham has responsibility for coordinating the testing of novel CMOS-based sensor designs for particle physics applications, and ultimately producing a summary of the results (WP6.3). This is an international effort, and the candidate will need to liaise with a variety of institutes, primarily between the University of Birmingham and the Rutherford Appleton Laboratory (RAL), as well as lead the testing and development of devices locally. Devices being made within the context of the separately-funded DECAL and OverMOS detector development projects will be tested for AIDA-2020, as will other designs that serve as R&D for future technology options for the ATLAS tracker upgrades. It is expected that further CMOS-based sensors made within the context of ATLAS or AIDA-2020 will be available for test during the duration of this post; these will be investigated as well.

For ATLAS, the candidate has the opportunity to become involved with the detector upgrade construction work at Birmingham and RAL. Within the ATLAS Upgrade project, Birmingham will be building silicon strip modules for the upgraded tracker, and the successful candidate will have the opportunity to contribute strongly to this effort. It is envisaged that the post will initially be based at RAL, where the candidate will have the opportunity to develop construction techniques and procedures that will then be implemented at Birmingham's BiLPA Laboratory some time in the second year of the post, when the post-holder moves physically to Birmingham.

The successful candidate will have the opportunity to take a leadership role in strip module assembly and mounting, performance studies, and DAQ for the ATLAS tracker upgrade, and will be expected to further develop the use of CMOS as a technology for tracking in the next generation of trackers at high-energy colliders. In addition to the development of detector elements, the post-holder will be integrated into the Birmingham ATLAS Group where there will be some opportunity to work with students on physics analysis projects.

Person Specification

Essential criteria

- PhD in experimental particle physics or related discipline
- Ability to undertake original research
- Ability to think logically
- Ability to work independently and also as part of a team
- Good problem solving skills
- Good communication skills

- Self-motivated
- Experience with the detectors or electronics used in particle physics
- Willingness to travel within the UK and Europe for meetings and discussions

Desirable criteria

- Knowledge of particle physics detectors and analysis techniques (highly desirable)
- Experience with semiconductor detectors
- Experience with CMOS pixel detectors
- Computing skills including programming
- Knowledge of analogue and digital electronics
- Experience with DAQ systems
- Experience with Monte Carlo simulations
- Experience with physics event reconstruction and analysis