



The Physics Institute at the **Albert-Ludwigs-University of Freiburg (Germany)** has two openings for

Doctoral Students to work on the Development of Semiconductor Detectors.

Successful candidates are expected to work in the field of semiconductor detectors, primarily on silicon detectors for high-energy particle physics. The activities of our group in this area extend over the following topics:

- Development of silicon strip detector module concepts and layouts for the ATLAS HL-LHC upgrade;
- R&D on radiation hard silicon detectors.

Two project proposals are given below. Full details of the PhD topic will be decided together with the successful applicant. The PhD course involves cooperation with national and international groups working the field, as well as interaction with the electrical and mechanical workshops of our institute.

Applicants should hold a very good Masters degree or Diploma in particle physics. Experience with semiconductor detectors would be an extra asset. The university is seeking to increase the number of female scientists and therefore encourages suitably qualified women to apply.

The positions are available until filled. Applications, including a CV, should be sent to: Christina Skorek, Universität Freiburg, Physikalisches Institut, Hermann-Herder-Str. 3, 79104 Freiburg or via email to christina.skorek@uni-freiburg.de.

More information can be obtained from:

Dr. Susanne Kühn, susanne.kuehn@physik.uni-freiburg.de, phone +49 761 203 8534

Dr. Ulrich Parzefall, ulrich.parzefall@physik.uni-freiburg.de, phone +49 761 203 5960

Prof. Karl Jakobs, karl.jakobs@uni-freiburg.de

Project Proposals

- 1) Silicon detectors form the key precision tracking device in all LHC experiments, with a significant increase in silicon area foreseen for the HL-LHC detector upgrades. This thesis project is centered on a study of new sensors, which will be produced on 6- and 8-inch p-type wafers from leading manufacturers. Several test systems and a number of techniques should be used to investigate the novel sensors. In the course of the thesis, the applicant is expected to commission an Edge-TCT setup to operate at cold temperatures. Afterwards, systematic measurements with complementary setups like a beta-source, laser system and an Edge-TCT system are planned to be conducted to enhance the understanding of these silicon strip sensors. The aim is to fully determine the sensors' performance before and after irradiation to high doses, including annealing behaviour. Moreover, the studies are foreseen to evaluate whether they are applicable as radiation hard sensors for the upgrade of the silicon strip tracker of the ATLAS experiment.
- 2) The Freiburg silicon detector group is heavily involved in the upgrade of the strip tracking detector of the ATLAS experiment. The candidate is expected to investigate silicon strip-detector prototypes in a range of different sensor technologies and layouts. This includes connecting sensors to new binary front-end readout electronics which is under development in the ATLAS Inner Tracker Collaboration. In the course of the thesis project, the development, assembly and testing of silicon-module prototypes is foreseen. Their performance will be evaluated in the laboratory, in test beam and irradiation tests. Moreover, assembly methods need to be developed in order to significantly contribute to the large-scale production of the upgrade silicon strip tracker of the ATLAS detector.



The particle physics groups at the University of Freiburg invite applications for PhD student positions hosted by the DFG funded Research Training Group, *Mass and Symmetries after the Higgs Discovery at the LHC*.

PhD Student Positions:

- Open call: evaluations in June, September, November 2015
- Positions in particle physics - experiment and theory
- Application information: www.grk2044.uni-freiburg.de/applicationinformation

Research Fields:

- Precision Higgs-boson measurements
- Weak vector-boson scattering and production
- Searches for BSM physics
- Detector development for the high-luminosity LHC

Participating Scientists:

- Experiment: H. Fischer, G. Herten, K. Jakobs, S. Kühn, U. Landgraf, U. Parzefall, M. Schumacher, C. Weiser, S. Zimmermann
- Theory: S. Dittmaier, F. Febres Cordero, H. Ita, H. Rzehak, J. van der Bij

