

Several positions to work on the Upgrade of the LHCb experiment at Universitat de Barcelona

- Postdoc researcher position on LHCb data analysis and R&D for the Upgrade 2 (U2) electromagnetic calorimeter (ECAL)
- Engineer position on microelectronics design for the U2 ECAL ASIC

The LHCb experiment at the LHC proton-proton collider at CERN is dedicated to studies of heavy flavour physics, with the major goal of testing the Standard Model of particle physics and finding any potential deviations due to New Physics in decays of heavy hadrons. After a major upgrade, LHCb is restarting data taking in 2022. Over the next few years, it will collect unprecedented data samples bringing the measurements to a new level of precision.

The Experimental High Energy Physics group at the Universitat de Barcelona has an extensive experience in data analysis involving rare decays and has participated since the inception of the detector in calorimetry R&D.

Postdoc researcher position on LHCb data analysis and U2 calorimeter studies

The Universitat de Barcelona invites applications for a Postdoc position to work on the LHCb experiment at CERN's Large Hadron Collider.

Applicants must have a PhD in experimental particle physics or in a related field with relevant experience. A very good knowledge of software development and modern programming languages (e.g. C++, Python) are necessary, experience with detector physics, instrumentation and GEANT4 are advantageous.

The successful candidate is expected to take an active role in LHCb data analysis in regarding hints for lepton flavour non-universality either in electroweak penguin decays or in semileptonic decays, as well as in the R&D carried out by the group for the Upgrade 2 calorimeter, including the participation in test beams.

The initial term of the appointment is 2 years with the possibility of a 3rd year extension based on funding and performance. There is the possibility to co-supervise students.

The position will be based in Barcelona but will require regular travel to CERN.

Applications should include a statement of interest (1 page) and CV (max 2 pages), as well as three reference letters. All of the required documents should be sent to Ricardo Vázquez (ricardo.vazquez.gomez@cern.ch) and Carla Marin (carla.marin@cern.ch). The deadline for applications is July 3rd 2022. The position start date is negotiable, with the earliest possible date being October 1st 2022.

Engineer position on microelectronics design for the U2 ECAL ASIC

JOB DESCRIPTION

As a research engineer specialized in ASIC design there are several tasks to be performed by the candidates. These are the capacities requested for the candidates (not all of them are required for the candidate)

- Analog ASIC design:
 - definition of specifications
 - circuit design and layout
 - floor-planning
 - Sign-off
 - writing of the technical operating documentation and the simulation and test reports
- Digital ASIC design:
 - Experience in VHDL or Verilog, and TCL scripting.
 - Knowledge of the full design flow: from RTL description, to synthesis, physical implementation, post layout verification and generation of a clean GDS.
 - Low-power optimization techniques.
- Characterization:
 - Experience with lab instrumentation.
 - Testing, verification and characterization
 - Calibration & characterization
 - Participation in test beams
 - Participation in radiation qualification campaigns
- The candidate will collaborate effectively with all parts of the ASIC design: from definition to conception and until evaluation.
- The candidate must be able to work in collaboration with other engineers.
- The selected candidates will work in the follow-up of the projects, writes the documentation and publications and makes the associated presentations

- The selected candidates will advise the users (physicists and engineers directly attached to the research groups) on the operation of the circuits
- The selected candidates will collaborate with groups from different research centers and industries

REQUIRED QUALIFICATIONS

- Engineering degree or equivalent with additional training and relevant experience oriented towards electronics, computer science and development of ASICs.
- Good knowledge of electronics and excellent knowledge of computer tools for ASIC design (Cadence) and simulation (spectre).
- Written and oral proficiency in English to perform all tasks described in both languages

DESIRED QUALIFICATIONS

- Good knowledge of digital and signoff tools (Cadence Genus & Innovus tools).
- A PhD in electronics will be positively considered.
- A few years of professional experience in ASIC development will be positively considered.

OTHER COMPETENCIES

Human capacity for conciliation and negotiation

- Ability to manage, plan and anticipate tasks before execution
- Ability to organize large international projects
- Ability to manage multiple tasks in parallel
- Ability to follow, acquire and master the latest high-tech techniques

The position will be based in Barcelona but will require regular travel to CERN.

Applications should include a statement of interest (1 page) and CV (max 2 pages). All of the required documents should be sent to David Gascon (dgascon@fqa.ub.edu) and Eduardo Picatoste (epicatoste@fqa.ub.edu). The deadline for applications is July 3rd 2022. The position start date is negotiable, with the earliest possible date being October 1st 2022.

EMPLOYMENT CONDITIONS

The positions are offered for two years, with the possibility of extending them up to a total of three years, based on funding and performance.

Gross annual salary will be commensurate with experience of the candidate and includes social security and public healthcare benefits, covering spouse and children.

EQUAL EMPLOYMENT OPPORTUNITY STATEMENT

The Institute of Cosmos Sciences is an equal employment opportunity employer. The Institute of Cosmos Sciences promotes a diverse and inclusive environment and welcomes applicants regardless of age, disability, gender, nationality, race, religion or sexual orientation. We strongly encourage women and underrepresented minorities in physical sciences to apply. For additional information please see the Diversity, equity and inclusion Commission.

ICCUB

The [ICCUB](#) is an interdisciplinary centre with more than 70 long term scientists, more than 20 engineers and 80 postdoctoral researchers and PhD students offering an international and multicultural environment. The ICCUB also hosts a vibrant fundamental research program in cosmology, astrophysics and particle physics, with a strong technology unit supporting our participation in international collaborations in observational astronomy and experimental particle physics.

The selected candidates will be involved in the R&D of new ground and space instruments for some of the scientific key international projects, among others: [LHCb](#) detector at [CERN](#), the Cherenkov Telescope Array ([CTA](#)) observatory and the High Energy cosmic-Radiation Detection ([HERD](#)).

The ICCUB [technology unit](#) has an important technology transfer activity in medical imaging and single photo sensor readout technology. Some of our developments have been transferred to the industry. The selected candidates will be also involved in this activity, in coordination with international leading research centres and industries.