Laboratoire de Physique de Clermont, Université Clermont Auvergne - CNRS/IN2P3

Tenure Track Position in ATLAS in 2022

University of Clermont-Auvergne, CNRS/IN2P3

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A tenure track position is proposed in the ATLAS team of LPC Clermont-Ferrand and University Clermont Auvergne (UCA).
This type of position (Chaire Professeur Junior) was recently created in France, giving access to a permanent position as a University Professor. After a pre-tenure period of 4 years, the candidate is eligible for tenure at the Université Clermont Auvergne as a University Professor in the ATLAS group.

During this period, the candidate will benefit from substantial support from CNRS/IN2P3 and UCA by financing two postdocs (2 years each) and 2 PhD thesis students that the recruited person will supervise. These supports are intended to create a strong dynamic in carrying scientific analysis and instrumental contributions to the project within the ATLAS team of LPC Clermont-Ferrand.
During the four years, a teaching duty is foreseen at the university's Physics department (64 hours of teaching per year), and CNRS/IN2P3 will support a reduction of the teaching duty at the beginning of the Professorship position.

The ATLAS team is part of the Laboratoire de Physique de Clermont (LPC). This lab includes LHCb, ALICE, LSST, theoretical physics, and research teams in physics applied to health, environment and energy. The LPC is hosted by the University of Clermont Auvergne (UCA) and is part of the National Institute of Nuclear and Particle Physics (IN2P3), a division of the National Center for Scientific Research (CNRS). About half of the 150 members of the LPC work in one of the technical departments (computer science, mechanics, electronics and microelectronics) or the administrative department.

The team is a founding member of the ATLAS collaboration and made a significant contribution to the scintillating tile hadronic calorimeter (TileCal) and physics analyses, notably with top quarks (the first thesis on this subject defended in 2002). The Atlas@Clermont team is also active in the HL-LHC Phase 2 upgrade, for many years on TileCal and since 2018 on HGTD. For several years, the team has specialised in the search for new physics with a final state containing one or more top quarks (ttbar resonances, tbbar resonances) and notably initiated in ATLAS in 2011 the search for events containing four top quarks, observed for the first time in 2020. Since 2013, the team was largely involved in the search for the associated production of a

Higgs boson and a pair of top quarks (ttH), finally observed in 2018 before investing in the search for di-Higgs events.

Among many other possibilities, the Run 3 data will allow putting additional constraints on the SM relying on Effective Field Theories (EFT) interpretations, conduct searches for new physics and studies of the Higgs tri-linear coupling. The latter is a crucial point of the HL-LHC physics program. This search can benefit from advanced Machine Learning approaches for which the team has developed solid expertise thanks to generic searches.

To prepare the HL-LHC, an evolution of the ATLAS detector is underway, with strong participation of the ATLAS team, specifically in what concerns the design of a new generation of detectors: the High Granularity Time Detector (HGTD). Contributions include design, construction, beam tests and general performance studies of the integrated electronics.

The new member will provide targeted contributions to these research lines and the ongoing instrumental developments within the ATLAS@Clermont team. Obtaining a Chair in LPC Clermont-Ferrand will consolidate this scientific program and open new opportunities.

The future professor will join the School of Physics and Engineering, and they will contribute to reinforcing the teaching potential at UCA. They will be strongly involved in teaching Physics and associated methods and being involved in the training of students from the bachelor (Licence de Physique, Physique-Chimie or SPI) to Master level (Fundamental Physics and its Applications or Nuclear Engineering). Moreover, beginning next Fall, new courses will be available with the onset of the Graduate School « Mathematics and Physics in the digital era ». The future professor will also be offered the possibility to lecture in English, thus contributing to the university's internationalisation policy development.

The candidate is expected to have experience in:
- data analysis at the LHC, especially in data analysis in the Top quark, Higgs, or their extensions in New Physics models;
- supervising research, PhD students and analysis groups in a large collaboration;
- Monte Carlo simulations, computational tools and statistical interpretation ;
- operation or development of detectors at the (HL-)LHC;
- experience in teaching.

The position is described on this link:
https://www.galaxie.enseignementsup-recherche.gouv.fr/ensup/ListesPostesPublies/FIDIS/0632084Y/FOPC_0632084Y_42.pdf

Additional information on:
https://www.uca.fr/universite/travailler-a-luca/recrutement-chaire-professeurs-juniors

Application is open from March 30 to April 29 (4 pm) on the national Galaxie interface:
https://galaxie.enseignementsup-recherche.gouv.fr/antares/can/astree/index.jsp

CV template is provided here:
https://www.uca.fr/medias/fichier/fiche-de-candidature-cpj_1648568133347-docx?ID_FICHE=154912

Final results are expected by mid of June, with taking office in September 2022.

For further information about the ATLAS team, please get in touch with Djamel Boumediene (Djamel.Boumediene@cern.ch, +334 73 40 72 97, CERN 67455).