



Laboratoire d'Annecy de Physique des Particules

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Job Offer Reference

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Accelerator Physics Postdoc as part of the H2020 FCCIS project (M/F)

Summary

The LAPP laboratory offers a postdoc physicist or engineer position within the framework of FCCIS (*Future Circular Collider Innovation Study*), a project funded by the European Commission under the Horizon 2020 framework program of the European Union (grant agreement no. 951754). The candidate will join the LAPP FCC research team as well as the international collaboration leading the work package of the FCCIS that will deliver a performance optimized FCC-ee accelerator design, integrated with the territorial requirements and identified constraints (such as cost, long-term sustainability, operational efficiency and energy/environmental impact minimization). The main objectives include: (1) Optimise the collider parameters and layout; (2) Develop and document the machine detector interface, final focus, analysis and control of vibrations, background control and luminosity measurements; (3) Develop and document the collider beam optics and lattice design, including the interaction regions.

The main mission is to develop an ambitious research and innovation project at LAPP in the field of Accelerator Physics and within the framework of CERN programs, in particular the future FCC accelerator.

Position and Main Responsibilities

All the activities envisaged fall within and relate mainly to the design of the interaction region and the accelerator-detector interface:

- The LAPP accelerator team has developed and mastered solutions for controlling nanometric beams, mainly within the framework of Linear Collider projects (eg: CLIC and ATF2). This work is carried out in collaboration with different CERN groups (beam, alignment, magnets, integration) and the team is currently transferring its skills to the new generation FCCee circular collider project with the SuperKEKB project in Japan as a demonstrator. In this context, the candidate will be in charge of beam optics calculations and simulations of different experiments (FCCee, SuperKEKB and ATF2) to identify performance limitation induced by vibrations of the accelerator elements, especially the elements of the final focus system. The results will contribute to define vibration tolerances and to develop dedicated vibration control of the accelerator elements and their interplay with beam feedbacks. In this way, he will collaborate in the development of accelerator simulation codes with the international teams of the collaboration.
- The candidate could participate in the scientific coordination of the vibration control part dedicated to the detector machine interface (MDI) of FCC-ee. In addition, he / she will also have the possibility for investing in a new thematic potential dedicated to the effects induced by the static positioning of the various elements of the accelerator.
- The candidate will participate within the LAPP team and in collaboration with the CERN team in the exploration of other themes and aspects of the FCCee feasibility study.
- The candidate will have specific responsibilities which may evolve and have various scientific implications.

Qualifications

- It is essential that the candidate has a doctorate in relevant accelerator physics topics, having previously obtained a BSc or Master in Physics.
- Candidate is expected to have relevant experience and demonstrated skills on practical or simulation physics R&D projects and a genuine interest and enthusiasm for physics, particularly accelerator physics.
- Experience with relevant simulation codes for tracking and for optics calculations (ex. MADX/PTC, PLACET) and experience in simulation studies addressing accelerator physics, optics and global modelling. A knowledge of the development software of the experiences (ex. Python, Matlab, C++) will be appreciate.
- Excellent communication skills and an ability to work individually or as part of a team are expected.
- Proven experience in applied research in accelerator physics.
- Knowledge of experimental high-energy particle physics.
- Willingness to be punctually or in the longer term on an experience site in France or abroad
- Spoken and written English: the ability to draw-up technical specifications and/or scientific reports, and/or to make oral presentations.
- Good knowledge of French language or an undertaking to acquire it rapidly.

Context

LAPP is a laboratory of the Institute of Nuclear Physics and Particle Physics (IN2P3), an institute of the National Center for Scientific Research (CNRS) which coordinates programs in these fields. LAPP is a joint research unit (UMR 5814) of the CNRS and the University Savoie Mont-Blanc (USMB). More than 150 researchers, engineers, technicians, administrators, students and foreign visitors work there. The research carried out at LAPP aims to study the physics of elementary particles and their fundamental interactions, as well as to explore their links with the great structures of the Universe. The work of the LAPP teams aims, among other things, to understand the origin of the mass of particles, to unravel the mystery of dark matter or to determine what happened to the anti-matter present in our universe at the time of the Big Bang.

Référence :

Site web LAPP : <https://lapp.in2p3.fr/>

Site web CERN: <https://home.cern>

Site web FCC: <https://fcc.web.cern.ch>

Information :

Type of contract: **temporary contract**

Appointment period: **24 months with possibility of extension**

Scheduled Hire date: **01/02/2021**

Working quota: **Full time**

Remuneration: **between 2648€ and 3054€ monthly gross**, according to work experience

Workplace: **LAPP at Annecy (74941)**

Trips: **Some short trips have to be planned in France and abroad**

Desired educational level: **PhD**

Desired work experience: **beginner - less than 2 years of experience**