



L'Institut de Physique Nucléaire d'Orsay (IPN), CNRS laboratory CNRS located at the campus of University Paris Sud in Orsay, search for a 2 years contract, from 1st September 2019:

POST-DOCT FOR ENERGY RECOVERY LINAC AND PERLE PROJECT M/F

Mission:

Position is at Institut de Physique Nucléaire d'Orsay France (IPNO), in the MOdelisations-Calculs team of the Accelerator Division of the laboratory.

PERLE is a proposed Powerful Energy Recovery LINAC for Experiments, designed on multi-turn configuration, based on SRF technology, to be studied and later hosted at Orsay, in a collaborative effort between local laboratories: IPNO and LAL (Laboratoire de l'Accélérateur Linéaire), together with an international collaboration. A part from its experimental program, PERLE will be a unique leading edge facility designed to push advances in accelerator technology, to provide intense and highly flexible test beams for component development. In its final configuration, PERLE provides a 500 MeV electron beam using high current (20 mA) acceleration during three passes through 801.6 MHz cavities. A Conceptual Design Report has already been published in 2017 [1].

In this context, missions will concern the detailed design conception of the demonstrator in order to propose a realistic implantation in existing building at Orsay. It must be also integrated to the existing pre-design made by PERLE collaboration, some additional functionalities in order to answer to more local scientific needs in terms of others applications.

[1] D. Angal-Kalinin, PERLE: Powerful Energy Recovery LINAC for Experiments - Conceptual Design Report, <https://arxiv.org/abs/1705.08783>

Activities:

Activities will concern detailed studies of the optic design of the machine. A first proof of principle lattice has been done at JLAB in the CDR context and also for a energy downgraded version of PERLE (at 500 MeV). A carefully study the optic design and a detailed analyze of the collective effects in arcs should be produced, both in acceleration and recovery mode. The impact of an energy injection upgrade from 5MeV up to 7MeV on the optics, especially in the switchyards must be evaluated. Also, the phasing of the machine starting with one acceleration cryomodule must be study. The beam optic in the arcs and its consequences must also be evaluated.

Skills:

Need to high level skills in the accelerator design and beam optics.
Skills in the beam dynamic tools like Elegant, MADX ...
Languages: French and English (written/oral)
Autonomy, organizational capacity and ability to report
Ability to communicate and argue, analysis, synthesis and critical thinking
Ability to learn and develop skills, flexibility and adaptability, creativity

Training and professional experiences:

PhD in the fields of accelerator, or high energy physic up to 3 years post-doctoral positions.

Salary:

Between 2693 and 3839 euros gross salary per month, depends of experience.

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Context:

IPN Orsay is a CNRS/IN2P3 laboratory with around 305 staff members funded by the CNRS and located at the campus of the University Paris-Sud at Orsay. The campus is conveniently located 20 km south of Paris and is easily reachable by regional train (35 mins).

Four divisions compose the laboratory. The research division lead research in nuclear physics, astrophysics, radiochemistry and pluridisciplinary in a local, national and international context. The two technical divisions, Accelerators (DA) and Instrumentation and Computing (D2I), studies and realized experimental set-ups in an original approach by developing supraconducting accelerating cavities for the linear accelerators and cryogenic for the first one and by married various technologies like detection, mechanics, electronics, computing for the second one. Administrative, logistic/infrastructure are in DALI division.

The MOCA team of the Accelerator Division is composed to five peoples engaged in various domains of the accelerator conception and associated projects like MYRRHA, SPIRAL2, FCC, MLL-TRAP.

PERLE project is a collaborative effort between local laboratories: LAL and IPNO, together with an international collaboration involving today: CERN, JLAB, AsTEC Daresbury, Liverpool University and BINP Novosibirsk.

Collaboration can be done with CERN and BINP-Novosibirsk focus on the magnets design. The later collaboration (with BINP) will be in the framework of H2020 CREMLINplus project, settled to foster scientific cooperation between the Russian Federation and the European Union in the development and scientific exploitation of large-scale research infrastructures.

An experimental part of the work can be realized during the commissioning of the CBeta facility at Cornell-University US (<https://www.classe.cornell.edu/Research/ERL/CBETA.html>).

Travels in France, Europe and United States are to be expected (~ 1/month).

Contact:

Researchers or research engineers interested in the position are requested to submit a motivation letter, a CV to Portail Emploi CNRS : <https://emploi.cnrs.fr/> Ref : UMR8608-NATCHE-012

<http://bit.ly/2PjmHyD>

More information about IPN :

<http://ipnwww.in2p3.fr/>