A two-year **post-doctoral position in nuclear astrophysics**, starting in **October 2018** and founded by CNRS-IN2P3, is offered in the experimental nuclear structure group of **IPNL** (Institut de Physique Nucléaire de Lyon, France). The successful candidate will work with the local team in the framework of a collaboration with the nuclear astrophysics group of GANIL (Grand Accélérateur National d'Ions Lourds, in Caen, France). The work will be focused on the **preparation of an experimental campain** aiming at the measurement of cross sections that are crucial for the modelling of the **p-process nucleosynthesis**.

The p-process nucleosynthesis is expected to take place in explosive astrophysical environments, during which thousands of nuclear reactions eventually lead to the formation of 35 stable proton-rich nuclei, so-called p nuclei. The observed abundance of these nuclei is currently not fully reproduced by models. Due to the huge number of reactions and high exoticity of many involved nuclei, large scale theoretical calculations are necessary to obtain most of the cross sections to be used. However, they sometimes diverge in their predictions, and crucial experimental measurements have to be performed to better constrain them. The p-process is believed to occur mainly through the photodisintegration of seed nuclei. The corresponding reactions can be studied using the inverse processes, namely neutron, proton and alpha captures. The relevant energy window is deeply below the Coulomb barrier, and many existing measurements do not reach this region. Our objective is to perform measurements of crucial proton and alpha capture cross-sections at unprecedented low energy, where their values are extremely weak.

This objective is stated in a letter of intent written by the IPNL and GANIL groups for the recent NFS-SPIRAL2 facility at GANIL. The idea is to take advantage of the unique combination of high-intensity, low-energy proton and alpha beams delivered by this accelerator, offering an opportunity for previously inaccessible measurements. The project is focused on preparing and realizing experimental campaigns based on activation and in-beam (angular correlations and gamma summing) techniques.

The successful candidate is expected **to define and to prepare the in-beam experimental setups** that will be established for the **NFS campaign**, expected to take place around 2020. In parallel, s.he is expected **to propose and to realize preparatory experiments** to study some reactions of interest at an already operational facility in Europe, with existing detection systems, in order to pinpoint possible difficulties and validate the discovery potential of the project. To this purpose, different tasks will have to be performed, in the areas of simulation, experimental realization and data analysis. The simulation part is important to select the experimental technique to be adopted, to identify the most promizing reactions to be studied, to optimize the setup in terms of detector type and geometry, and to characterize the response of the detection system.

Applicants should hold a Ph.D. in experimental nuclear physics; expertise in nuclear astrophysics will be especially appreciated. Proficient programmation skills are requested, a good knowledge of C++, ROOT and GEANT4 being an advantage.

Review of applications will begin **immediately** and will continue until the position is filled. Applications should be sent in any case **before July, 1st**. Results will be communicated before the end of July, and the contract will start early October. Interested candidates should send a CV and two cover letters to Camille DUCOIN (ducoin@ipnl.in2p3.fr) and Beyhan BASTIN (bastin@ganil.fr).