



## Call for candidates at CEA Saclay Postdoctoral fellowship in nuclear physics

The Nuclear Physics Division (DSM/IRFU/SPhN) of the French Atomic Energy and Alternative Energies Commission (CEA) at Saclay invites applications **for a post-doctoral position in experimental low-energy nuclear structure physics.**

Research at SPhN is conducted in four areas: Nucleon and hadron structure, quark-gluon plasma, nuclear reactions and their applications and nuclear structure. Concerning the latter, The Laboratoire d'Études du Noyau Atomique (LENA, Laboratory for nuclear structure study) has three research axes: the study of the shapes of nuclei, of the exotic nuclei, and of heavy and super-heavy elements. The candidate will work on this last topic.

Understanding the shell structure of nuclei, and in particular the location of next shell gaps beyond  $^{208}\text{Pb}$ , is one of the key objectives of nuclear structure physics. Nevertheless, the structure in this extreme region of the nuclear chart is largely unknown and the predictions between different models vary considerably. For that purpose, we study the structure of Transfermium nuclei via various spectroscopic methods. In this context, we are involved in experimental programs at GANIL (and in the future at the S3 spectrometer at SPIRAL2), and at JYFL (Finland).

Fusion-evaporation reactions are of paramount importance to produce exotic nuclei in the neutron-deficient side of the stability valley, from the  $N=Z$  nuclei up to the superheavy elements. But these exotic nuclei are produced with very low cross sections, and many reaction channels may be open. The identification of those nuclei is therefore very complex. One possibility is to measure their decay properties, either atomic (X rays, electrons) or nuclear (proton, alpha, electron or gamma-ray emission). At Saclay we focus on the use of silicon detectors to detect and measure the implanted ions and the particle decay. For this purpose a new focal plane detector system (SIRIUS) has been designed for the  $S^3$  spectrometer that will be operational in 2018.

The main task of the proposed project consists of test and commissioning the SIRIUS detection set-up for decay spectroscopy. The post-doc will pursue the full test and characterization of the whole focal plane array, more specifically of the implantation and tunnel detectors along with their associated front-end electronics. Furthermore the candidate will participate to the in-beam tests and to the first experiments at GANIL. The candidate will also be in charge of simulations, integration, and tests in laboratory at Saclay. The candidate will also take part in the experimental program of the group and in the subsequent analysis. In this way he/she will have access to a wide variety of data with good opportunities to publish new scientific results.

Applicants are required to have a PhD in experimental nuclear physics and experience in data analysis. Experience using spectrometers, semi-conductor detectors and associated instrumentation for nuclear spectroscopy is also desirable as well as good knowledge of data-analysis tools especially ROOT and C/C++ programming skills.

The application will be composed of:

- A curriculum vitae
- A letter of motivation (2-3 pages)
- A list of publications, talks in conferences and seminars
- Contact information of two references.

**Full applications should be sent in pdf format at latest on the 27<sup>th</sup> of June to Barbara Sulignano at [barbara.sulignano@cea.fr](mailto:barbara.sulignano@cea.fr) and Antoine Drouart at [antoine.drouart@cea.fr](mailto:antoine.drouart@cea.fr).**

The position is initially for one year, renewable upon mutual agreement for a second year. The contract could start autumn 2016.