



CEA Irfu/DPhN

Commissariat à l'énergie atomique et aux énergies alternatives



2-years postdoctoral researcher position at CEA Saclay Irfu/DPhN Development of the SEASON detector and spectroscopy of neutron-deficient actinides

The laboratory for nuclear structure study (LENA, Laboratoire d'Etude du Noyau Atomique) invites applications for a 2-years postdoctoral position in experimental low-energy nuclear structure physics. The LENA is part of the Nuclear Physics Division (DPhN) of the Institute of Research into the Fundamental Laws of the Universe (Irfu) located at CEA Paris-Saclay (France). Irfu is a highly dynamic scientific environment including research divisions on astrophysics, nuclear and particle physics as well as strong technical and engineering divisions in instrumentation, cryogenics and accelerator technologies. The LENA is composed of 13 permanent staff physicists, 2 theorists and 11 experimentalists, working on the study of shapes of nuclei, of the exotic nuclei and heavy elements. The candidate will work on this last topic.

Experimental studies of nuclei far from stability represent a major challenge in the region of heavy nuclei due to the low fusion-evaporation production cross sections involved, as well as due to the short lifetimes of the unstable reaction products. In the near future, thanks to high-intensity beams delivered by the "Super Separator Spectrometer (S3)" at GANIL/SPIRAL2, it will be possible to produce heavy nuclei with intensities 15 to 20 times larger than those available at existing facilities. At the S3 focal plane, the "Low Energy Branch (LEB)" will allow performing laser-ionisation spectroscopy of the selected nuclei, thus providing opportunity to deduce nuclear ground-state properties independently from the nuclear models. The SEASON (Spectroscopy Electron Alpha in Silicon bOx couNter) detector will be part of the S3-LEB. The SEASON project is funded by an ANR JCJC and the proposed postdoctoral position is part of this project.

The goal of the SEASON detector is the realisation of heavy nuclei spectroscopy, investigating ground or isomeric states, by applying a pioneering method : the comparison of observables measured by laser-ionisation spectroscopy (atomic physics approach) with the results obtained by alpha, conversion electron and gamma decay spectroscopy (nuclear physics approach). The successful candidate is expected to play a leading role in the offline and online commissioning of the SEASON detector. He/She will be involved in the analysis of the first experiment performed with SEASON at IGISOL, University of Jyväskylä, aiming to perform the decay spectroscopy of neutron-deficient actinides, for which strong octupole deformations are predicted, produced by proton-induced fusion-evaporation reactions.

Applicants should have completed, at the time of start, a PhD in nuclear physics and have expertise in data analysis. A prior experience with the development and/or operation of semi-conductor detectors dedicated to nuclear spectroscopy would be beneficial. Applications should include :

- A 2-page cover letter including a description of previous work experience
- An academic CV including a list of the candidate's most relevant publications and talks given in international conferences or workshops
- Contact information of 2 references

Applications should be sent in pdf format before June 30th 2021 to marine.vandebrouck@cea.fr and antoine.drouart@cea.fr. Questions related to the postdoc opening may be sent to the same email addresses. The contract could start in December 2021.