



Call for candidates at CEA Saclay Postdoctoral fellowship in nuclear physics

The Nuclear Physics Department (DRF/IRFU/DPhN) 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 DPhN 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 nuclear shapes, of the exotic nuclei, and of very-heavy and super-heavy nuclei (SHN). The candidate will work on this last topic.

Understanding the shell structure of nuclei, and the location of next shell gap beyond lead 208, is one of the key objectives of nuclear physics. Nevertheless, the structure in this extreme region of the nuclear chart is largely unknown. The predictions vary considerably between different models and precise data are mandatory. For that purpose, our group studies the structure of transfermiums via spectroscopic methods in order to gain insight into their properties and develop the required instrumentation. In this context, our group is involved in experimental programs at GANIL (notably SPIRAL2/S³), Jyväskylä (Finland) and GSI (Germany).

The primary activity of the candidate will be the preparation of the commissioning of the S³ spectrometer, which is in its final construction stage at the Spiral2 facility in Caen: she/he will optimize the full simulation of the spectrometer line (using the *TraceWin* software) taking into account the latest magnetic measurements performed on the S³ magnets. She/he will work on the physics simulations of the key experiments and will be involved in the tests and commissioning of the S³ equipment (notably the SIRIUS decay station). This task will imply a significant presence at GANIL.

The second activity of the candidate will be on a new method to produce super-heavy nuclei. Instead of using the classical fusion-evaporation reaction, the idea is to produce neutron-rich very/super heavy nuclei using transfer of several nucleons between the target and the beam. A first successful test was carried out at Argonne National Laboratory in the USA in 2019, and given the positive results, a new experiment will be carried out in 2022. The post-doctoral fellow will lead the experimental effort, perform the data analysis and compare the results with different theoretical models.

Applicants are required to have a PhD in experimental nuclear physics and be familiar with data analysis. Experience with optics calculations and spectrometer physics is a plus. 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.

This post-doctoral position is for two years, potentially renewable upon mutual agreement for a third year. The contract could start as soon as April 2022.

Interested candidates should send their application to Antoine Drouart antoine.drouart@cea.fr and Barbara Sulignano barbara.sulignano@cea.fr **before the 28th of January 2022.**