



Call for candidates at CEA Saclay Postdoctoral fellowship in nuclear physics

The Nuclear Physics Division (DRF/IRFU/DPhN) of the French Atomic Energy and Alternative Energies Commission (CEA) at Saclay invites applications **for a post-doc 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. The Laboratoire d'Études du Noyau Atomique (LENA, Laboratory for nuclear structure study) focuses on three research axes: studies of nuclear shapes, of exotic nuclei, and of heavy and super-heavy nuclei. It is also strongly involved in development of instrumentation for nuclear physics studies.

The Advanced GAMMA Tracking Array (AGATA) is the next-generation high-resolution γ -ray spectrometer that is presently being constructed in Europe. It has passed its early demonstrator phase, consisting of 15 high-purity germanium detectors, and is growing towards a 4π array of 180 detectors, with completion in 2030. It is the key instrument for nuclear structure research in Europe, intended to be used at the main European nuclear physics laboratories such as GANIL, FAIR, HIE-ISOLDE, SPES and JYFL where a wide range of experiments will be performed including those with low γ -ray multiplicity but high ion velocities, to high-spin, high γ -ray multiplicity experiments. Because of the importance that AGATA performs at its best under these widely different conditions, the ANR project "Optimization of AGATA science production" (OASIS) has been proposed, aiming at improving the basic ingredients of AGATA, i.e. pulse-shape analysis and γ -ray tracking, and optimizing its use.

Although the overall performance of AGATA's γ -ray tracking is good, there are several points that deserve further investigation including; the fidelity of the detector models used to produce the reference pulse-shapes that are needed for the pulse-shape analysis is insufficient, and it is difficult to correctly assign the number of γ -ray interactions inside one detector segment.

The post-doc will focus on investigating ways to address these issues, which may include:

- evaluation of effects from geometrical variations in the crystals,
- implementation and investigation of charge carrier cloud effects,
- implementation of an error estimate in the pulse-shape phase to help γ -ray tracking,
- performing PSA and γ -ray tracking in one step.

The work will consist of computer modelling of the detectors and of simulations of the γ -ray interactions inside the detector system. It will be done in close collaboration with the part of the OASIS team working at CSNSM and GANIL on the characterisation of the AGATA detector system, and on the data analysis. The post-doc will also have an opportunity to participate in experiments of the LENA group, as well as in activities of the AGATA detector laboratory at Saclay.

Although research with AGATA is primarily directed towards nuclear structure, we also encourage applications from candidates with a different scientific background, as new ideas may stem from broadening our collaboration.

The position is for one year, renewable upon mutual agreement for a second year, and could commence as early as November 2018.

Interested candidates should contact Magda Zielińska (magda.zielinska@cea.fr). A motivation letter, curriculum vitae and two reference letters are required. The deadline for applications is August 31, 2018.