

Post-Doc offer

Neutron scattering instrumentation around a compact neutron source

CONTEXT

The French and European neutron scattering landscape is strongly evolving. Several research reactors have stopped their operations and further closure are foreseen in the next decade. The European landscape will be renewed by the construction of the ESS European Spallation Source (underway in Sweden). In addition, the construction of a new type of neutron sources using low energy high current accelerators (HiCANS) is being proposed by various institutes across Europe to replace research reactors. The characteristic of these new sources is to produce pulses of polychromatic neutrons rather than continuous beams. Among the projects, we can mention SONATE in France [1], HBS in Germany [2] or ARGITU in Spain. Building, imagining, and making the best use of these neutron beams to carry out physics experiments still constitutes a challenge for the IRAMIS / LLB teams. In particular, these experiments are essential to “invent” the neutron diffraction of tomorrow.

OBJECTIVES:

The general objective is to develop and evaluate technical solutions for time-of-flight diffraction for compact long-pulse sources. The work will involve a strong experimental part with the evaluation of the performances of the DioGENE instrument on the accelerator IPHI at Saclay and the instrument HERMES on the BIG-KARL facility at COSY. It will be necessary to quantify the background noise issues, the methodology of the data acquisition as well as the processing of neutron scattering data acquired in event mode. As part of the development of a diffraction instrument for a future compact source, innovative solutions will be evaluated, such as the use of statistical choppers.

Part of the experimental work will be carried out in collaboration with the Forschung Zentrum Jülich where the HERMES spectrometer will be installed.

PROFILE & COMPETENCES

1. Neutron scattering techniques
2. Instrumentation (control-command)

The current offer is for a position spanning over 18 months.
Starting period, winter 2022.

[1] [SONATE, an accelerator-driven neutron source](#)

[2] [HBS: High Brilliance Neutron Source](#)