

M1 internship in experimental nuclear physics

Efficiency and resolution measurement for the decay of superheavy nuclei

Superheavy elements are atoms whose number of protons exceeds 104. They are produced in laboratories in minute quantities (only 7 nuclei of Oganesson ($Z=118$) have been observed worldwide) and pose a scientific challenge because their existence has defied theory for over fifty years.

In order to learn more about these extreme nuclei, the SIRIUS detector has been designed to measure their radioactive decay and study their unique structure. It is installed on the S^3 spectrometer, whose goal is to create and then select isotopes of superheavy elements with unparalleled efficiency.

The aim of the internship will be to test the detectors of SIRIUS, a device dedicated to the measurement of the decay of superheavy nuclei. SIRIUS uses silicon detectors and emissive foil detectors instrumented with new generation digital electronics. The measurements aim at quantifying the energy resolution and the collection efficiency of the detectors.

[GANIL-SPIRAL2](#) (Grand Accélérateur National d'Ions Lourds) facility in Caen, France, is one of the 5 largest and leading laboratories in the world engaged in research with ion beams with the main focus being fundamental nuclear physics. The intensity and variety of beams delivered by the cyclotrons and the superconducting linear accelerator and the associated state-of-the-art scientific instruments make GANIL-SPIRAL2 an unique and outstanding multi-disciplinary facility. Several hundreds of researchers, from all over the world, come to GANIL annually for experiments, seminars, or longer stays.

Requested skills:

Knowledge in scientific programming (e.g., C++, ROOT, Java, etc.) for experimental data analysis using LINUX and Windows platforms is mandatory

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