

Investigating the structure of superheavy nuclei with SIRIUS

The study of superheavy nuclei has made large progresses these last years with the discovery and naming of the last four known elements nihonium, moscovium, tennessine and oganesson. Access to these nuclei is a technical challenge due to the very low production cross-sections. In order to go beyond the known isotopes it is necessary to have a better understanding of the nuclear structure of superheavy nuclei.

The SPIRAL2 LINAC will deliver in the coming years very high beam currents. These beams require a dedicated instrument to be used as efficiently as possible. The Super Separator Spectrometer S3 and its decay station SIRIUS were designed to study rare isotopes, produced in fusion-evaporation reactions. SIRIUS (Selection and Identification of Rare Isotopes Using S3) is the combination of a high-efficiency silicon box for the alpha and conversion electron spectroscopy with an array of High Purity Germanium Clover detectors for gamma-ray spectroscopy. Its specifications are designed to be able to access nuclear structure through decay spectroscopy of rare isotopes including superheavy nuclei.

GANIL will receive the parts of SIRIUS this autumn. The instrument has to be mounted, tested and commissioned before it is installed at the focal plane of S3.

The object of this internship will be to participate in the functional tests and offline commissioning of SIRIUS. The selected candidates will be put in charge of the tests of the silicon detectors and the validation of the acquisition chain.

Tutor : Julien Piot

Laboratory : GANIL

e-mail address : piot@ganil.fr

Telephone number : 02 31 45 46 44