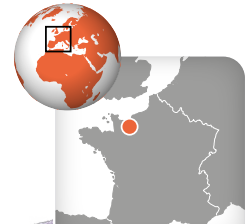
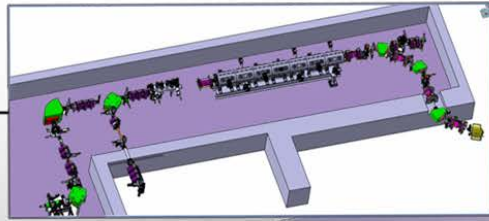


Innovative sources of ions



SPIRAL2 installation at GANIL, Caen, Normandy

NEWGAIN NEW GANIL INJECTOR

Explore the heaviest and most deficient atomic nuclei

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- **Scientific leader:** Gheorghe Iulian STEFAN (IJCLab) *
- **Laboratories involved:** GANIL (Caen), IJCLAB (Orsay), IP2I (Bordeaux), IPHC (Strasbourg), LPCC (Caen), LPSC (Grenoble)
- **Nature:** research infrastructure
- **Status:** National project in the Pre-Detailed Design (PDD) phase

30 million euros (total cost estimated)

35 metres of beam lines

2030 expected launching date

10 to 1000 times more intense than the current source depending on the ions

SCIENTIFIC OBJECTIVES

The nuclear interaction defines the properties of atomic nuclei and their interactions. A thorough understanding of this interaction is achieved by studying a wide variety of nuclei, from the most classical to the rarest, in different excited states. By generating a high intensity flux of heavy ions down to uranium, the NEWGAIN project will give the SPIRAL2 facility an unprecedented capacity to study some of the heaviest and most exotic nuclei in the Universe with high precision.

RESOURCES DEPLOYED

The technical project aims to build a second injector for the linear accelerator of the SPIRAL2 installation, capable of generating a high intensity beam with heavy to superheavy ions: Xenon (atomic number 54), Lead (82), up to Uranium (92). It will rely on a large-volume superconducting ion source that is unique in Europe. It will be coupled to a new radio frequency quadrupole (RFQ) optimised for the acceleration of these ions, whose mass/charge ratio will reach 7 (compared to 3 for the current injector). The facility is expected to operate 24/7, excluding maintenance periods. Thus the NEWGAIN project will give the SPIRAL2 facility an unprecedented capacity to study some of the heaviest and most exotic nuclei in the Universe with high precision.

IN2P3 CONTRIBUTIONS

- Superconducting heavy ion source, System Engineering.
- Design and Integration of the High Voltage platform.
- Design of the beam lines.
- Dynamic beam calculation and diagnostic design

OTHER FRENCH LABORATORIES INVOLVED

Irfu (CEA Saclay)

2020

Kick-off meeting of the project

2021

Start of the APD phase, publication of the white paper and start of the EQUIPEX NEWGAIN

2023

Start of the construction phase anticipated

2028

First beam with the existing SPIRAL2 source planned

2030

First beam with the NEWGAIN source to be launched