



Internship in experimental nuclear physics

Finalization of the characterization of PIPERADE at LP2iB

Description

PIPERADE (Pièges de Penning pour les RADionucléides à DESIR) is a double Penning trap being developed in Bordeaux, which will be installed at the DESIR facility at GANIL.

This instrument has two objectives: 1) perform precision mass measurements of exotic nuclei, providing valuable information on nuclear structure, the forces acting within the atomic nucleus (strong and weak interactions), and stellar nucleosynthesis, 2) perform the mass selection of nuclei of interest among a large number of contaminants, with very high resolving power ($> 10^6$) and a high capacity ($> 10^4$ ions per bunch). It will therefore provide to all other experimental setups in the DESIR hall an ultra-pure ion beam, greatly improving the precision of measurements of various observables, such as lifetimes, charge radii or electromagnetic moments.

The characterization of PIPERADE using a stable-ion beam has been ongoing at LP2iB since 2019 and will be completed in 2027, before the instrument is transferred to GANIL in summer 2027. This M2 internship will therefore be perfectly synchronized with the final phase of the project at LP2iB. It will focus primarily on finalizing the characterization of the PI-ICR (Phase-Imaging Ion-Cyclotron-Resonance) mass-measurement technique

Expected skills

Python programming, Experimental nuclear physics, Mass spectrometry, Electronics and data acquisition, Ion trapping

This work [leads to a PhD-thesis](#).

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