PhD Thesis in Experimental Nuclear Physics

Workplace: LP2i Bordeaux, France
Duration of the contract: 36 months
Starting date of the thesis: October 1st, 2022
Contact: Beatriz Jurado, jurado@cenbg.in2p3.fr

Description of the thesis topic

The cross sections of neutron-induced reactions on short-lived radioactive nuclei are essential for understanding the synthesis of chemical elements in stars and for industrial applications. However, their measurement is very complicated, if not impossible, due to the high radioactivity of the required targets. The most promising alternative to determine these cross sections is the use of surrogate reactions in inverse kinematics. In these reactions a beam of heavy ions interacts with light targets to form the same nuclei as those formed by neutron capture. The proposed thesis work will be part of the NECTAR (Nuclear rEaCTions At storage Rings) project. NECTAR is funded by a prestigious grant of the European Research Council (ERC) with the objective of combining for the first time surrogate reactions with the heavy ion storage rings of the GSI/FAIR facility in Germany, which offer the ideal conditions for the study of this type of reactions.

The objective of the proposed thesis is to participate in the preparation and realization of the next NECTAR experiment, which will take place at GSI/FAIR. The candidate will be in charge of the realization of simulations to optimize the experimental setup. She/he will also work with the researchers and engineers of LP2iB and GSI/FAIR on the design, test and integration of a new detection system for this experiment. This system is particularly innovative as it is based on the use of solar cells. He/she will also be responsible for the analysis of the data obtained during the experiment and their interpretation. Furthermore, the candidate will present her/his work in international conferences and will actively participate in the writing of articles.

Required skills

- Master's degree in physics
- Clear interest in experimental nuclear physics
- Good communication skills
- Good command of spoken and written English.
- Experience with programming languages such as Python and C++, as well as with the ROOT data analysis program will be appreciated.

Working conditions

Frequent travel to GSI in Darmstadt, Germany, is to be foreseen, with stays of several weeks to several months. The working hours are those of LP2iB and GSI, except in exceptional cases, for example during experiments.

Interested candidates should send their application before the 20th August 2022 via this link:
https://emploi.cnrs.fr/Offres/Doctorant/UMR5797-STEGUE-005/Default.aspx?lang=EN
Including a CV, a cover letter and the grades from the last two years.