

## PhD position in the WISArD experiment at LPC Caen

WISArD (Weak-Interaction Studies with  $^{32}\text{Ar}$  Decay) [1,2] is a high precision experiment mounted at the radioactive ion beam facility ISOLDE at CERN. Its aim is the test of the Standard Model in the weak-interaction sector, using nuclear  $\beta$  decay, as a complement to high energy physics experiments. Exotic currents in the weak interaction are searched for in the beta-neutrino angular correlation coefficient, usually called  $a_{\beta\nu}$ , which will be measured at the 0.1% precision level.

The  $a_{\beta\nu}$  correlation coefficient governs the kinematics of the  $\beta$  decay : depending on its value, the recoil energy of the nucleus varies. Direct measurements of this energy are possible but very challenging, as it does not exceed a few keV. The approach chosen in the WISArD experiment is the measurement of the energy distribution of protons emitted in flight by the daughter nucleus of  $^{32}\text{Ar}$ . As the protons are emitted in flight, the Doppler effect modifies the measured energies which thus reflect the nuclear recoil.

After a successful proof-of-principle experiment in November 2018, before CERN's long shut-down, the short-term aim is the design and mounting of the final set-up for a series of measurements once CERN restarts experiments in 2021.

The GRIFON group of LPC Caen seeks candidates for a three-year PhD position on WISArD. Candidates should have completed their Master in Nuclear Physics or a related subject. They are expected to have a strong taste for experimental techniques as well as scientific programming and data analysis. They will work in a highly competitive international environment.

The position will be for about 1 year at CENBG in Bordeaux and then at ISOLDE/CERN. The main tasks include the characterization and mounting of the silicon detector set-up for proton detection and of the plastic scintillators for the  $\beta$ -particle detection. Interests in other projects of our collaboration will be strongly supported.

Students interested in the position are requested to submit a motivation letter, a CV as well as support letters to Xavier Flécharde ([flechard@lpccaen.in2p3.fr](mailto:flechard@lpccaen.in2p3.fr)) before April 30, 2019.

[1] <http://isolde.web.cern.ch/experiments/wisard>

[2] N. Severijns, B. Blank, J. Phys. G: Nucl. Part. Phys. 44 (2017) 074002