PhD Position in Nuclear Experimental Physics and Related Instrumentation

Title: Development of XEMIS camera, from small animal to human total-body scale

The Xenon group of the SUBATECH laboratory is seeking a highly motivated PhD student to work on the XEMIS (XEnon Medical Imaging System) project and future long-term perspectives.

The group is strongly involved in the development of a new 3 photons medical imaging technique based on the simultaneous use of a $(\beta^+,\gamma)$ emitter and a liquid xenon detector. The liquid xenon technology is being investigated since a long time in the Xenon group with the aim of detecting $\gamma$-rays in the MeV energy domain through Compton scattering. Proof of concept of Compton cone reconstruction was achieved by means of a first small Time Projection Chamber prototype called XEMIS1. The second liquid xenon camera called XEMIS2 is under installation in Nantes University Hospital and will contribute to preclinical research studies on small animals. The involved technologies range from cryogenics of liquefied noble gas, to detection of UV scintillation light and ionization signals with ultra low noise electronics.

The long-term objective of the XEMIS project is to realize a larger and highly sensitive camera, with possible applications in ultra low dose medical diagnostics and online monitoring of hadrontherapy.

The PhD student is expected to contribute to the installation and commissioning of the XEMIS2 camera and to the analysis of the first data. He/She will also contribute to the associated Monte Carlo simulations for a deeper understanding of the detector response.

We welcome highly motivated students with a master degree in physics and a solid background in particle physics, interaction of ionizing radiations with matter and related detector technologies. Good computing skills and previous experiences on Monte-Carlo, data treatment and analysis are advantageous.

Applications should include a curriculum vitae, description of research experience, a letter of motivation and two letters of recommendation. Only fast applications will be considered, PhD contract is starting on October 1, 2020.

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