



PhD Call for applicants in Experimental Nuclear Physics: “Experiments for range verification in protontherapy”

A call for a PhD Grant (Spanish FPI) is open at the Basic Nuclear Physics group of University of Sevilla within the project “*Física Nuclear y Aplicaciones Médicas en el CNA e Instalaciones Internacionales*”. The group has ongoing research lines for measurements of nuclear reactions, production and use of neutron beams, and simulation and experiments for particle therapy. The thesis work is related to the latter, in particular to the field of proton range verification techniques in protontherapy (more on *Phys. Med. Biol.* 60 (2015) R155–R209 and *Phys. Med. Biol.* 58 (2013) R131–R160 review papers).

The goal of the thesis will be to carry out studies intended to improve the QA procedures in particle therapy; in particular it will initially focus on the study of the interaction of low, medium and high energy proton beams with different materials in order to improve the current use of prompt gammas and delayed gammas from β^+ emitters produced along the proton beam path in a patient as a proxy of the beam range. The student will be fully involved in simulating, preparing, performing and analyzing the experiments, which are part of a collaboration with LMU in Munich within the ENLIGHT project. The first phase, using low energy proton beams, will take place at CNA in Sevilla and the Garching Tandem accelerator in Munich; while the second phase experiments will be carried out at clinical beams such as CNAO in Pavia or equivalent facilities.

Project:	- FPA2016-77689-C2-1-R (“ <i>Física Nuclear y Aplicaciones Médicas en el CNA e Instalaciones Internacionales</i> ”) dirigido por J. M. Quesada Molina y J. Gómez Camacho. Forefront research in experimental nuclear physics. El supervisor principal de la tesis será C. Guerrero Sánchez.
Requisites:	- Master degree in Nuclear Physics - Availability to travel - Good level of English
Skills:	- Basic knowledge of programming (preferred C++) - Basic knowledge of Monte Carlo simulation (Geant4, FLUKA) and analysis (ROOT) tools. - Initiative - Good communication and team-work skills
Contract:	- Four years contract as FPI (Formación de Personal Investigador)
Deadline:	- October 18 th , 2017

The call can be found in MINECO “Ayudas para contratos predoctorales para la formación de doctores 2017” (proyecto FPA2016-77689-C2-1-R). Interested applicants please contact:

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