



PhD Call for applicants in Experimental Nuclear Physics: “Production and use of laser-driven neutron beams for physics”

A call for a PhD Grant is open at the Basic Nuclear Physics group of University of Sevilla within the EU “NeutAndalus” and the national “*Física Nuclear y Aplicaciones Médicas en el CNA e Instalaciones Internacionales*” projects. 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 production and use of neutron beams, in particular to the use of high power laser to accelerate charged particles and then produce high intensity pulsed neutron beams (see <https://doi.org/10.1103/PhysRevLett.110.044802>). Although very intense neutron beams have already been produced, the neutron beams have not yet been used for experiments in nuclear research. A preliminary study (see <https://doi.org/10.1140/epja/i2017-12261-2>) has shown that the neutron beam intensities achieved with currently existing lasers can be comparable in terms of instantaneous flux to the most competitive facilities existing nowadays.

The successful candidate will work within the University of Sevilla group, becoming automatically a member of the CERN n_TOF Collaboration and the CNA HiSPANoS user community. He/she will work in the development of the first time-of-flight experiments for physics with laser-driven neutron beams. The candidate will perform experiments at the CNA HiSPANoS and CERN n_TOF facilities in order to test and validate detectors and techniques that will then be employed at high power laser facilities such as CLPU and/or L2A2 in Spain as well as the Laboratory for Extreme Photonics in Germany. The final objective is the improvement of current techniques for neutron production and diagnostic with lasers, as well as performing the first cross section measurements with a laser-driven neutron beam.

Terms and duration of the contract: The candidate is expected to start working on January 2018 with a contract for 3 years with economic conditions equivalent to the national FPI program.

Research:	- Experimental nuclear physics: laser driven neutron beams
Requisites:	- BSc in Physics - MSc in Physics (preferred in Nuclear Physics)
Skills:	- Knowledge of programming, data analysis and simulation codes. - Experience with radiation detectors - Experience with the use of particle accelerators - High level of English - Initiative - Good communication and team-work skills
Contract:	- Three years contract

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