

PhD position at IFIC

Instituto de Física Corpuscular. Valencia. Spain.

The IFIC (CSIC-UVEG) – Valencia Severo Ochoa Excellence Research Centre participates in the INPhINIT programme, offering postgraduate fellowships for PhD studies. INPhINIT relies on the European Commission's support through the Horizon 2020 Marie Skłodowska-Curie Actions- COFUND programme.

Background:

The IRIS group (Image Reconstruction, Instrumentation and Simulations for medical applications, <http://ific.uv.es/iris>) of IFIC has a wide experience in the development of medical imaging systems in the fields of PET, Compton Imaging and Hadron Therapy. The main research lines combine both detector development and image reconstruction, and are currently focused on the development of a Compton telescope for hadron therapy treatment monitoring and of a PET system with monolithic crystals coupled to silicon photomultipliers. The group benefits from the interaction with other groups at IFIC working on high energy physics, and also with several hospitals. It counts with a fully equipped laboratory and a microPET/CT for research purposes. The group has participated in several European and international projects and collaborations.

The Compton telescope is made of three detector layers of LaBr₃ crystals coupled to SiPMs. The group activities include the full range of detector development: system simulations, detector and electronics assembly and testing, characterization and data analysis, development of image reconstruction algorithms and tests in beam. The current version of the telescope prototype has been successfully developed and tested in the laboratory and in beam campaigns. The system is capable of operating two or three detector planes, and of imaging radioactive sources of different energies. The system limitations for the application have been identified, and an improved version is under development. The new version will feature last generation silicon photomultipliers and will be capable of using the information conveyed by two and tree-interaction events for the energy spectrum found on clinical environments. The group proposes a three years PhD position to participate in the system development.

Job position description:

Development of a Compton telescope for hadron therapy treatment monitoring.

The successful candidate is expected to participate in all aspects of the development and testing of the new version of the telescope, with a further specialization of her/his main area of interest. The candidate will receive advanced training on detectors and electronics, MonteCarlo simulations of the system and the physics of signal building, and also on iterative image reconstruction methods. She/he will also participate in the daily tasks of the group, such as supervising Master students, attending seminars and courses, etc. Optionally, the candidate will have the possibility of teaching at the University of Valencia. In addition, researchers establish a personal career development plan including transnational, intersectoral and interdisciplinary mobility opportunities, and attend a full range of complementary training courses and workshops.

Requirements:

- University degree in physics, informatics, mathematics or a related field with a good final grade (300 ECTS credits, of which at least 60 ECTS credits must correspond to master level).
- Strong motivation and interest in the field and the project.
- Candidates must have a demonstrable level of English (B2 or higher).
- Candidates must be in the first four years (full-time equivalent research experience) of their research careers and not yet have been awarded a doctoral degree.
- Candidates must not have resided or carried out their main activity (work, studies, etc.) in Spain for more than 12 months in the 3 years immediately prior to the recruitment date.

The following skills will also be valued:

- Programming skills (preferably C++), knowledge of data analysis codes (preferably ROOT), knowledge of simulation codes GEANT4, GATE, FLUKA.
- Fellowships, training courses, etc. related to medical imaging.
- Experience in image reconstruction and/or instrumentation.
- Experience in hadron therapy or Compton imaging.

A basic knowledge of Spanish can be helpful, but is not required for the position. Female candidates are encouraged to apply.

Applications:

Further information and application requirements can be found in:

<https://obrasociallacaixa.org/en/educacion-becas/becas-de-posgrado/inphinit/about-inphinit>

Application period is from 7th November 2016 to 2nd February 2017. Starting dates are from September 2017, and no later than January 2018.

Interested candidates can also contact Dr. Gabriela Llosá (gabriela.llosa@ific.uv.es) or Dr. Josep F. Oliver (josep.f.oliver@uv.es) for further details.