



PhD position in experimental neutrino physics

The new generation of accelerator-based neutrino-oscillation experiments, currently under design and construction, has as a prime goal the quantification of CP violation in the lepton sector of the Standard Model, as well as the precise measurement of all parameters of the neutrino mixing matrix. To achieve these ambitious goals, the experiments will employ very intense neutrino beams (above 1MW) together with some of the largest and most sensitive detectors ever employed in neutrino physics. In particular, the **Deep Underground Neutrino Experiment (DUNE)** will make use of large time projection chambers (TPCs) of liquid (for the *near* and *far* detectors) or gaseous (for the *near* detector) argon. The Instituto de Física Corpuscular (IFIC), in partnership with the Instituto Gallego de Física de Altas Energías (IGFAE), is involved in both the near and far detector systems.

We offer a PhD in the context of the DUNE experiment, focused on the development of position-sensitive scintillation-based detection technologies. In terms of its particle-tracking capabilities, DUNE is arguably the most sophisticated neutrino detector ever built, however its potential for imaging is not fully exploited due to the limitations inherent to operation in liquid phase. This work aims at expanding the experiment's capabilities by making use of gas and dual liquid-gas phases.

The successful candidate will join an experienced team at improving the optical readout of both the far and near detectors by exploring among others SiPMs, as well as the recently-introduced TimePix cameras, that allow for the first time the 3D optical readout of large sensitive volumes with few mm precision. The PhD work will be performed jointly between IFIC (Valencia) and IGFAE (Santiago de Compostela), with stays at both centers foreseen. We expect the candidate to lead at least one of the experimental campaigns to take place at CERN from 2024 on (plausibly at protoDUNE and/or RD51/DRD1 experimental sites), taking responsibilities for data analysis and physics simulations.

Interested candidates please contact Justo Martín-Albo (justo.martin-albo@ific.uv.es) and Diego González Díaz (diego.gonzalez.diaz@usc.es) before 15th March 2023.