

## PhD position in neutrino physics at CIEMAT

The Neutrino Physics Group of CIEMAT (Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas) announces the upcoming opening of a predoctoral position for MSc graduates (at the moment of the contract formalization) interested in working on **experimental neutrino oscillation activities towards a PhD Thesis**.

CIEMAT-FP participates in the Deep Underground Neutrino Experiment (DUNE), a leading-edge, international experiment for neutrino science. Discoveries over the past half-century have put neutrinos, the most abundant matter particles in the universe, in the spotlight for further research into several fundamental questions about the nature of matter and the evolution of the universe - questions that DUNE will seek to answer. DUNE will study high-energy neutrinos from a new, high-intensity neutrino beam generated by a proton accelerator at Fermilab (USA), and will detect them after propagating over a distance of 1300 km with a far detector located deep underground. The physics program also addresses non-beam physics as nucleon decay searches and the detection and measurement of the electron neutrino flux from a core-collapse supernova within our Galaxy. The DUNE far detector is composed by four large liquid-argon TPC detectors of 10-kt fiducial mass each. The DUNE program includes, as a first step, large-scale liquid argon prototypes (ProtoDUNEs), operating at the CERN Neutrino Platform, to demonstrate the technology to leverage large risks associated to the extrapolation from existing experience to the huge mass required for neutrino detectors. The CIEMAT-FP neutrino group participates in the photon detection system and is involved in the proton decay searches and supernova neutrino detection studies for DUNE. The group also participates in the near detector of the Short-Baseline Neutrino Program at Fermilab to search for sterile neutrinos. The proposed job will be part of the DUNE program focused in the operation and data analysis of the liquid-argon prototypes, and in the physics sensitivity studies for the DUNE far detector. Funded research stays at CERN (Switzerland) or Fermilab (US) are possible.

The **4-year PhD contract** (Personal Investigador Predoctoral en Formación or Formación de Personal Investigador-FPI) is funded by the Spanish Ministry of Science and Innovation through the “Programa Estatal de Promoción del Talento y su Empleabilidad en I+D+I” (FPI). **This position is associated to the research project “CIEMAT contribution to the DUNE neutrino science program”**, reference number **PID2019-104676GB-C31**. The **official call** is available at [http://www.ciencia.gob.es/portal/site/MICINN\\_predoc2020](http://www.ciencia.gob.es/portal/site/MICINN_predoc2020). The deadline for applications is **October 27th**. It is also announced at <http://cfp.ciemat.es/predoc>.

The candidate must have a Master’s Degree in Physics or similar at the moment of the contract formalization (July-September 2021), a good English knowledge and strong interest in the neutrino physics field. Experience in C++ and Python programming will be also valuable.

For more information, please contact: Inés Gil ([ines.gil@ciemat.es](mailto:ines.gil@ciemat.es))

*The CIEMAT Particle Physics Unit is an affirmative action/equal opportunity employer. Eliminating gender inequalities by promoting equal opportunities for men and women is a core mission of our group and it is our commitment to establish the necessary actions to close the gender gap.*