



PhD position in Direct Dark Matter Search with Liquid Argon Detectors at CIEMAT

The Dark Matter research group (CIEMAT-DM) of the CIEMAT-FP Unit (*Centre for Research in Energy, Environment and Technology* in Madrid, Spain) announces the opening of a **predoctoral position** for outstanding young M.Sc. graduates interested in working in direct Dark Matter search activities towards a PhD Thesis.

The **4-year PhD contract** is funded by CIEMAT. The official call is announced in the CIEMAT webpage <http://www.ciemat.es/cargarAplicacionOfertaEmpleo.do?identificador=1519>. The code of this position is **11-PREII-20**. The **application deadline is 14th July**. The candidate must have a Master Degree in Physics (according to the Bologna Declaration). The main considerations for selection are high motivation, excellent grades, and strong interest in data analysis and hardware development for experimental particle physics. Experience in programming and scripting languages will be valued.

The CIEMAT-DM group is one of the founding members of the *Global Argon Dark Matter Collaboration* (GADMC). We are currently participating in the DarkSide-20k experiment, to be installed in the Gran Sasso National Laboratory (LNGS, L'Aquila, Italy), and in DEAP-3600 at SNOLAB (Canada). DarkSide-20k is a 20 tonne liquid argon (LAr) time projection chamber, and it is designed to be the most sensitive direct search dark matter detector in operation in the next decade. It is currently in design and prototyping phase. We are leading the radiopurity measurements of the detector components, coordinating the effort of several laboratories worldwide, and we are responsible for the definition of the experiment background. DEAP-3600 is the largest liquid argon detector for WIMP search and is currently taking data. We are heavily involved in background rejection using machine learning algorithms. In addition, we are constructing the DARtinArDM experiment at the Canfranc Underground Laboratory (LSC, Spain), whose goal is to measure the radioactive contamination of the argon extracted from underground reservoir, a key parameter for the Dark Matter search with argon. The group also has a record of R&D focused on exploiting the potential of the next generation of LAr detectors.

The PhD student is expected to work in the analysis of physics data, as well as in the development of innovative hardware, detector simulation and analysis software for current and future LAr detectors.

We offer close supervision within a very active and large research group, working in an international environment. The selected student is expected to spend part of his/her time at LSC, LNGS, and other collaborating institutes worldwide.

For any question, please contact: darkmatter@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 compromise of our group and it is our commitment to establish the necessary actions to close the gender gap.

PhD position in Cosmic Ray Physics with the AMS experiment on the International Space Station at CIEMAT (contract number 12-PREII-20)

The Cosmic Ray Physics research group of the CIEMAT-FP Unit (*Centre for Research in Energy, Environment and Technology* in Madrid, Spain) announces the opening of a **predoctoral position** for outstanding young M.Sc. graduates interested in working in Cosmic Ray Physics search activities towards a PhD Thesis.

The **4-year PhD contract** is funded by CIEMAT. The official call is announced in <http://www.ciemat.es/cargarAplicacionOfertaEmpleo.do?identificador=1519>, **contract number 12-PREII-20, being the application deadline the 14th July**. It is also announced at <http://cfp.ciemat.es/predoc>.

The Alpha Magnetic Spectrometer (AMS-02) is a high-energy particle physics detector operating on the International Space Station (ISS) since 19 May 2011. AMS-02 has operated continuously for more than 9 years on the ISS and has collected more than 10^{11} events. The experiment is planned to continue collecting science data until 2028.

The goal of the experiment is to carry out precise measurements of cosmic rays in the energy range from 1 GeV/n to 1 TeV/n. Accurate studies of the fluxes of individual components of cosmic rays are achieved thanks to the excellent particle identification and energy resolution of the detector.

The precise data obtained with AMS-02 allow addressing fundamental physics questions such as the nature of dark matter or the presence of primordial antimatter in the Universe. In addition, the accurate measurements of individual species of cosmic rays in a wide energy range provide a complete set of benchmark data to validate the state of the art models describing the propagation of cosmic rays in our Galaxy which, in turn, provide the prediction of the expected backgrounds in the AMS-02 searches for new physics.

The candidate is expected to participate actively in the AMS-02 operations in space, the detector offline calibration, data analysis and modelling. The results of this research should be communicated in international conferences and published in reference journals.

This research, oriented toward accomplishing a PhD degree in Physics, will be carried out under the supervision of the CIEMAT members of the AMS-02 collaboration.

For more information on the research project or any question regarding the application, please contact:

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