

## Predocutorial position in Experimental Astroparticle Physics at CIEMAT

# Models for cosmic ray propagation with the AMS experiment

The Alpha Magnetic Spectrometer (AMS-02) is a general purpose high-energy particle physics detector operating on the International Space Station (ISS) since 19 May 2011. AMS-02 has operated continuously for more than 5 years on the ISS and has collected  $10^{11}$  events. The experiment is planned to continue collecting science data until 2024.

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 goal of the research defining this PhD project is to provide significant improvement in the current models for cosmic ray propagation by means of the light elemental and isotopic measurements attainable with the AMS-02 data. The research project includes a survey of galactic cosmic ray propagation models and the identification of the AMS-02 potential contributions, the analysis of the AMS-02 data samples providing key measurements for the propagation models, and the assessment of the model predictions after the inclusion of the AMS-02 measurements.

The candidate is expected to participate actively in the AMS-02 operations in space, the detector offline calibration, data analysis and modeling. 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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