

The High Energy cosmic-Radiation Detection facility: an innovative apparatus design for cosmic-ray measurement

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The High Energy cosmic-Radiation Detection (HERD) facility will be installed aboard the China's Space Station (CSS) around 2025, and it will extend the direct measurements on cosmic rays by one order of magnitude in energy. This will be possible thanks to an innovative design that was carefully optimized to overcome the limitations that affect the experiments currently operating in space. In this talk, the HERD instrument will be presented: it is based on a large, homogeneous and isotropic calorimeter made of LYSO crystals, optimized in order to have good energy resolution and large geometric factor. The calorimeter is surrounded by a subdetector system, fiber tracker, plastic scintillator and silicon microstrip from inside out with fine segmentation, to allow for good angular resolution, multiple charge measurements of incoming particles. The detector is complemented by a transition radiation detector used to calibrate the high-energy hadronic calorimeter response in a data-driven way

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Primary authors: Dr MORI, Nicola (INFN Florence); THE HERD COLLABORATION; STARODUBTSEV, Oleksandr (Universita e INFN, Firenze (IT))

Presenter: STARODUBTSEV, Oleksandr (Universita e INFN, Firenze (IT))

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