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Progressing our understanding of cosmic rays with the HERD space-borne experiment

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A new generation of space experiments is needed to enhance our understanding of cosmic rays. The challenge of the direct detection at ever higher energies with improved energy and angular resolutions is guiding us in designing the detectors of the future. The High Energy cosmic-Radiation Detection facility (HERD) onboard the China Space Station will be the next calorimetric experiment. Starting from 2027 and for more than 10 years, HERD will be measuring cosmic protons and heavier nuclei from 30 GeV/nucleon to a few PeV/nucleon. It will search for dark-matter signatures in the energy spectrum of cosmic electrons from 10 GeV to 100 TeV and photons from 100 MeV to 100 TeV. The HERD design, prospects and expected performance, as well as its contribution to the multimessenger astronomy will be presented in this talk.

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