



## 6<sup>th</sup> Roma International Conference on AstroParticle Physics



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The Pierre Auger Observatory, in Argentina, is the present flagship experiment studying ultra-high energy cosmic rays. Facing the challenge due to low cosmic ray flux at the highest energies, the Observatory has been taking data since more than a decade, reaching an exposure of over 50 000 km<sup>2</sup> sr yr. The combination of a large surface detector array and fluorescence telescopes provides a substantial improvement in energy calibration and extensive air shower measurements, resulting in data of unprecedented quality. Moreover, the installation of a denser subarray has allowed extending the sensitivity to lower energies. Altogether, this contributes to provide important information on key questions in the UHECR field in the energy range from 0.1 EeV up to 100 EeV. A review of main results from the Pierre Auger Observatory is presented with a particular focus on the energy spectrum measurements, the mass composition studies, the arrival directions analyses, the search for neutral cosmic messengers, and the investigation of high-energy hadronic interactions. Despite this large amount of valuable results, the understanding of the nature of UHECR and of their origin remains an open science case that the Auger collaboration is willing to address with the Auger PRIME project to upgrade the Observatory.

#### Presentation type: oral or poster

Oral

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