

The Pierre Auger Observatory: Latest results and prospects for the future

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The Pierre Auger Observatory is the world's largest cosmic ray detector. It employs a hybrid technique combining a 3000 km² surface detector (SD) array comprising 1660 water-Cherenkov stations with 27 fluorescence telescopes, arranged in 4 sites, that overlook the atmosphere above the SD array during clear and moonless nights. In stable operation since 2004, we have published numerous breakthrough results regarding the properties of the highest energetic particles in the Universe with unprecedented statistics. Envisaging a deeper understanding of the highest energy cosmic rays, AugerPrime, the major upgrade of the Pierre Auger Observatory, will allow us to improve inferences on the mass composition and acceleration mechanisms, probe hadronic interactions at the $\sqrt{s} \sim 100$ TeV scale and increased search sensitivity for the sources of ultra-high-energy cosmic rays. We summarize our most significant results and prospects for the next decade of AugerPrime operations.

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