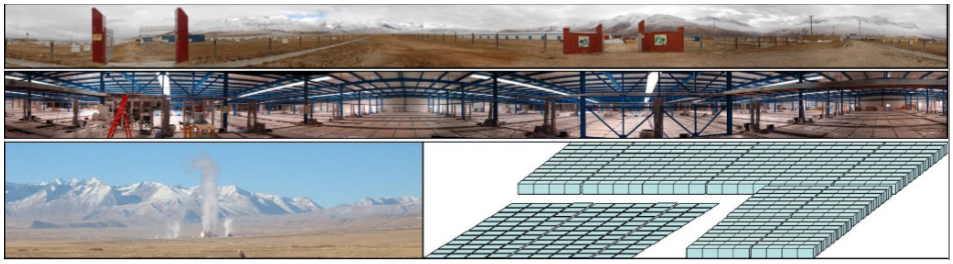

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The Pierre Auger Observatory and its performance

Thursday, 31 January 2013 16:20 (30 minutes)

Ultra High Energy Cosmic Rays (UHECR) represent the most energetic elementary particles available to scientists. They have macroscopic energies, exceeding 1 EeV, but their flux is very weak, one particle per century per square kilometre for the highest energies. Understanding their nature and origin is the objective of the Pierre Auger Observatory, which is located in the province of Mendoza (Argentina) and covers 3000 km2, being the largest cosmic ray detector in operation. Designed as a hybrid detector, it uses two techniques to measure the properties of extensive air showers by observing both their longitudinal development in the atmosphere with fluorescence detectors and their lateral spread at ground level with particle detectors. The combination of information from the two detector types enhances the reconstruction performance with respect to the individual detector components. The power of the hybrid detection and the high statistics of the surface detector bring valuable performances to measure the extended air showers with unprecedented precision. The collaboration has extended the Observatory with several complementary detection systems, which lower the energy threshold of the baseline detectors from 1 EeV to 0.1 EeV; the potential of radio-detection techniques to measure extensive air showers is studied at the Observatory site.

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