

**ASTROPHYSICS AND PARTICLE PHYSICS OF THE ULTRA HIGH ENERGY: COSMIC RAYS  
MEASURED BY THE PIERRE AUGER OBSERVATORY**

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The hybrid Pierre Auger Observatory, consisting of fluorescence detector with 24 telescopes and of surface detector with more than 1600 water Cherenkov stations, has been collecting high quality data since January 2004. In this contribution we present namely current results of studies of ultra-high energy cosmic ray composition and related results concerning the energy spectrum of these particles. The depth of maximum of air showers determined using fluorescence telescopes and the magnitude of the fluctuations of this maximum depth are reported as functions of energy. The results are compared with predictions of several hadronic interaction models. Then the other mass sensitive parameters from the measurements of the surface detector are briefly discussed. We update the analysis of correlation between the arrival directions of the highest energy cosmic rays observed by the Observatory and the positions of nearby active galaxies. Finally, we also mention the new limits on the flux of ultra-high energy photons and of diffuse ultra-high energy neutrinos, and we investigate the impact of these limits on top-down models of cosmic ray origin.