

Auger Open Data and Pierre Auger Observatory International Masterclasses

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Abstract

The Pierre Auger Observatory has a public data policy following the FAIR principles (Findable, Accessible, Interoperable, and Reusable). We aim to share the data with the scientific community as part of the multi-messenger effort at different levels and for educational activities to engage the general public. Following the first portal created in 2007, a new portal hosted at <https://opendata.auger.org> was established in February 2021. The portal is regularly updated and comprises 10% of the recorded cosmic ray data organized in various datasets, each with a specific DOI provided by Zenodo. Moreover, a catalog with the 100 most energetic events is available. The portal adopts a “dual” concept, offering not only the download of public data but also a series of Jupyter notebooks. These notebooks allow the general public to reproduce some of the most important results obtained by the Pierre Auger Collaboration and understand the main mechanisms governing the development of the extensive air showers produced by the interaction of cosmic rays in the Earth’s atmosphere. In 2023, the Pierre Auger Observatory joined the International Particle Physics Outreach Group (IPPOG). The successful debut enrolled 550 high-school students at 12 research institutions from 5 countries and was repeated this year, embracing yet more students and countries worldwide. During this day, the participants attend seminars about cosmic rays and are asked to reconstruct subsets of public data events using an Auger 3-D event display. Finally, they participate in a Zoom session with scientists at the Auger site.