



Contribution ID: 109

Type: **Talk**

Multimessenger Studies with the Pierre Auger Observatory

Wednesday 4 September 2024 09:30 (30 minutes)

The Pierre Auger Observatory, the world's largest ultra-high-energy (UHE) cosmic ray (CR) detector, plays a crucial role in multi-messenger astroparticle physics with its high sensitivity to UHE photons and neutrinos. Recent Auger Observatory studies have set stringent limits on the diffuse and point-like fluxes of these particles, enhancing constraints on dark-matter models and UHECR sources. Although no temporal coincidences of neutrinos or photons with LIGO/Virgo gravitational wave events have been observed, competitive limits on the energy radiated in these particles have been established, particularly from the GW170817 binary neutron star merger. Additionally, correlations between the arrival directions of UHECRs and high-energy neutrinos have been explored using data from the IceCube Neutrino Observatory, ANTARES, and the Auger Observatory, providing additional neutrino flux constraints. Efforts to correlate UHE neutron fluxes with gamma-ray sources within our galaxy continue, although no significant excesses have been found. These collaborative and multi-faceted efforts underscore the pivotal role of the Auger Observatory in advancing multi-messenger astrophysics and probing the most extreme environments of the Universe.

Internet talk

No

Is this an abstract from experimental collaboration?

Yes

Name of experiment and experimental site

Pierre Auger Observatory

Is the speaker for that presentation defined?

Yes

Details

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Session Classification: Cosmology, Astrophysics, Gravity, Mathematical Physics

Track Classification: Main topics: Cosmology, Astrophysics, Gravity, Mathematical Physics