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Search for ultra-high energy photons and neutrinos in the multi-messenger context at the Pierre Auger Observatory

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The Pierre Auger Observatory, the largest ultra-high energy cosmic ray detector ever constructed, has an unprecedented sensitivity to neutral primaries above 10^{17} eV.

After almost 20 years of data taking, stringent limits to the diffuse flux of photons and neutrinos have been derived, excluding many exotic models for the origin of UHE cosmic particles. Furthermore, targeted searches and follow-up analyses connected to the detection of gravitational waves have been carried out showing the high potential of the Observatory for high-energy multi-messenger astronomy.

We report here about the current activities and latest results of diffuse and targeted searches, along with the perspectives for the upgraded detector, which will further improve the Auger sensitivity providing new insights on the most extreme phenomena in the Universe.

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