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Multi-messenger implications of the Pierre Auger Observatory measurements

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The Pierre Auger Observatory is not only the world's largest cosmic-ray observatory, but also an efficient detector of cosmic particles other than nuclei. Using its enormous exposure, the Observatory is a competitive player in searches for ultra-high energy neutrinos, photons, and even particles that could emerge from theories beyond the standard model of particle physics. We present our recent results of such searches, targeting both the diffuse fluxes of particles and specific transient events. Special attention is given to the potential of the Observatory to support or constrain the observations of the ANITA experiment interpreted as upward-going air showers. The correlation of arrival directions of ultra-high energy cosmic rays measured by the Pierre Auger Observatory and the Telescope Array with high-energy neutrinos detected by IceCube and ANTARES experiments is also discussed.

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