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Multi-messenger studies with the Pierre Auger Observatory

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The Pierre Auger Observatory is the world's largest cosmic-ray detector, sensitive to cosmic rays with energy exceeding $\sim 10^{17}$ eV. In addition to charged cosmic rays that form the bulk of the cosmic-ray flux at ultra-high energies, Auger is sensitive to ultra-high energy neutral messengers (photons, neutrinos, and neutrons). The later are particularly exciting as they are expected to arrive in spatial, and temporal coincidence with electromagnetic counterparts from the yet unknown sources of ultra-high energy cosmic rays, and can be used for triggering, or follow-up in multi-messenger transient searches. I will review the activities of Auger as partner in multi-messenger searches, focusing on searches for ultra-high energy neutrinos from gravitational wave events, and the contribution of Auger to realtime multi-messenger searches within the Astrophysical Multi-messenger Observatory Network (AMON).

Author: Dr OIKONOMOU, Foteini (Penn State)

Presenter: Dr OIKONOMOU, Foteini (Penn State)

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