



Contribution ID: 1083

Type: **Invited talk in the parallel session**

## On correlation between diffuse gamma ray and neutrino backgrounds

*Tuesday, 6 July 2021 09:50 (20 minutes)*

In 2013, the IceCube Neutrino Observatory detected a diffuse background of high-energy astrophysical neutrinos, with energies extending above 1 PeV. Identifying astrophysical objects using this data alone is challenging due to faint neutrino signals.

High-energy neutrinos are produced in interactions of cosmic rays with matter or photon fields alongside gamma rays at similar energies. While neutrinos leave the sources mostly unaffected, gamma rays can be transmitted or absorbed and cascade down to lower energies. Neutrino sources can therefore be identified through their electromagnetic counterparts with correlations depending upon the source environments.

Studies using combined neutrino and gamma-ray observations have provided evidence for emission from at least one distant galaxy, TXS 0506+056, indicating that at least part of the neutrino diffuse background originates in active galaxies. The origin of the majority of the diffuse neutrino background still remains unknown. Recent candidate neutrino sources and their multi-messenger signatures will be discussed longline with the connection of the diffuse gamma-ray and diffuse neutrino fluxes.

**Primary author:** BERNARDINI, Elisa (Unipd)

**Presenter:** BERNARDINI, Elisa (Unipd)

**Session Classification:** Very High Energy Gamma Rays

**Track Classification:** High Energy: Very High Energy Gamma Rays