Contribution ID: **393** Type: **Talk**

Constraining the diffuse neutrino flux from gamma-ray burst blastwaves with the KM3-230213A ultra-high-energy event

Monday 21 July 2025 14:05 (15 minutes)

KM3NeT/ARCA is a deep-sea Cherenkov neutrino detector located 100 km off the coast of the southern tip of Sicily, Italy. When completed, the detector will instrument around one cubic kilometre of water with photodetectors to search for energetic neutrinos of cosmic origin. On February 13th 2023, a partial configuration of KM3NeT/ARCA detected the most energetic neutrino ever observed, with an estimated energy of 220 PeV. This intriguing discovery raises questions about the origin and potential sources capable of producing neutrinos of this energy. In this talk, we will discuss lepto-hadronic interactions in gamma-ray burst blastwaves as possible production sites for neutrinos of this energy. Moreover, we will discuss how the observation of the first-ever ultra-high-energy neutrino and the corresponding ultra-high-energy diffuse neutrino flux can provide new constraints on theoretical model parameters driving the emissivity of ultra-high-energy neutrinos from a larger population of gamma-ray bursts.

Collaboration(s)

KM3NeT

Authors: MYHR, Per; W DE WASSEIGE, Gwen (UCLouvain); RAZZAQUE, Soebur

Presenter: MYHR, Per

Session Classification: NU

Track Classification: Neutrino Astronomy & Physics