

Cosmic neutrinos: from meV to PeV

Friday, 26 March 2021 14:30 (30 minutes)

Summary

In this overview talk, I will cover wide range of energy spectrum of cosmic neutrinos from meV to PeV, focusing on experimental activities in which the Netherlands is heavily involved.

Firstly, I will discuss TeV-PeV range, where IceCube telescope at the South Pole detected many astrophysical neutrino events. Even though there are a few interesting coincident events claimed with blazar flares and a tidal disruption event, no source counterpart has been identified robustly. Better angular resolution and much deeper coverage of the Galactic center region might be the key to this, for both of which KM3NeT is well positioned.

Secondly, I will go down to MeV range, where both solar and supernova neutrinos are an interesting target. XENONnT and DARWIN, which are mainly a dark matter detector, are also capable of doing unique neutrino science for these sources.

Lastly, I will discuss an ambitious project PTOLEMY, which is aimed at detecting the relic neutrino background from the Big Bang – a neutrino counterpart of the cosmic microwave background. Since the temperature is only 2K, it is extremely challenging to detect these neutrinos. I will discuss possible detection strategies and related physics that has to be explored in the future to achieve this enormous goal.

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Session Classification: Update talks