Contribution ID: **1** Type: **Oral**

On the interpretation of astrophysical neutrinos

Tuesday, 4 June 2019 11:20 (30 minutes)

The discovery of a diffuse flux of high energy neutrinos, provided by the IceCube neutrino telescope in 2012, has opened a new era in the field of astroparticle physics and neutrino astronomy. Nowadays the statistics is large enough to have a good measurement of the muon neutrino flux and a sufficient knowledge of the all-flavor flux, but the main mystery still remains: what is the origin of these neutrinos? Different methods can be used to search an answer to this very important question.

The first method is a purely particle physics approach, consisting of the analysis of the flavor composition of the detected events. Although the flavor composition seemed to be already well known, a careful analysis of the most recent data shows surprising results.

The second method consists in a multi-messenger approach and it is more related to astrophysics. The brightest sources in the γ-ray sky above 100 GeV are blazars, so it is natural to expect that these sources are also neutrino emitters. On the other hand the absence of correlations between the arrival direction of neutrinos and the position of known blazars strongly constrains this scenario, unless neutrinos are produced by faint blazars. An alternative, but natural possibility, is that neutrinos are produced by hadronic accelerators (like Starburst Galaxies) from the interaction between accelerated protons and the gas. The Galactic plane of our Galaxy could also provide a contribution to the neutrino flux; a small but not negligible contribution.

In my talk I will cover these aspects, in order to give an overview of the possible interpretations of the diffuse flux of high energy neutrinos.

Collaboration name

Primary author: PALLADINO, Andrea (DESY)

Presenter: PALLADINO, Andrea (DESY)

Session Classification: Astroparticle Physics and Cosmology

Track Classification: Astroparticle Physics and Cosmology