Contribution ID: **102** Type: **not specified**

High-energy neutrinos from a nearby newborn pulsar

Tuesday, 5 May 2015 16:20 (20 minutes)

The electromagnetic wind of a fast-spinning pulsar provides favorable sites for cosmic ray acceleration from PeV to ultrahigh energies. We show that high-energy neutrinos are guaranteed to be produced in this system, when the accelerated particles interact with the dense baryons of the supernova ejecta. We study the light curves and energy spectrum of the neutrinos using both numerical and analytical methods. We find that the neutrino spectral index varies from 1.5 to 2, as a result of the interplay between the pulsar spin-down and the evolution of the supernova environment. We then discuss the impact of the chemical composition of the parent cosmic rays on the neutrino production. Moreover, we apply to the scenario to existing nearby young pulsars and find the corresponding neutrino flux consistent with the current non-detections. Finally, we explore the detectability of the high-energy neutrinos from future newborn pulsars in the Local Universe in light of current and next generation neutrino telescopes.

Primary author: FANG, Ke (University of Chicago)

Presenter: FANG, Ke (University of Chicago)

Session Classification: Neutrino Astrophysics

Track Classification: Neutrino Astrophysics