千葉大学大学院理学研究科附属
ハドロン宇宙国際研究センター
ICEHAP International Center for Hadron Astrophysics

# January ICEHAP Seminar

**Date** **Jan. 12th Friday 15:00～17:00**

**Location** **ICEHAP Office (Engineering Research Bldg.1 Room609-1)**

**By** **Professor Sarira Sahu**

**Instituto de Ciencias Nucleares, UNAM, Mexico City and Astrophysics Big Bang Laboratory, RIKEN, Wako Campus, Japan**

**Title**

## 『On the non-detection of Glashow resonance in IceCube』

**Abstract**

Electron anti-neutrinos at the Glashow resonance (GR, at $E_{\bar{\nu}_e} \sim 6.3$ PeV) have an enhanced probability to be detected. With three neutrinos detected by IceCube in the (1-2) PeV energy range at present, one would expect that about 1 to 4 GR $\bar{\nu}_e$ should have been detected. The high-energy $\sim 8.7$ PeV muon neutrino detected by IceCube may not be a GR event. If so, we expect to detect 50 to 70 GR $\bar{\nu}_e$, then one would have a "missing Glashow-resonance problem". This would suggest (1) that $p\gamma$ interaction rather than $pp$ interaction is the dominant channel to produce the observed IceCube high-energy neutrinos; (2) that multi-pion $p\gamma$ interactions are suppressed; and (3) that the magnetic field and photon energy density in the $p\gamma$ emission region is such that significant $\mu^+$ cooling occurs before decaying, yet $\pi^+$'s essentially do not cool before decaying.

**Location:** Neutrino Astrophysics Department

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