

ICEHAP Seminar

Nov. 4, Wednesday, 2pm, 2015

place: Fac. of Sci. Bldg 2, 3F, room No.308

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"Rethinking GRBs as sources of high-energy neutrinos"

Abstract

Following the recent discovery of high-energy astrophysical neutrinos by IceCube, much attention has been given to identifying their sources.

Gamma-ray bursts (GRBs) –the violent explosions that signal the death of massive stars– are one attractive possibility to explain at least part of the observed flux. Their high luminosities and compact sizes hint at potentially copious neutrino production via proton-photon interactions. However, the simplest models of neutrino emission from GRBs have been disfavored by the lack of neutrino detection from individual bursts. I will therefore introduce well-motivated generalizations in the form of a mechanism of joint neutrino and ultra-high-energy cosmic ray emission. By embedding this mechanism in a simulation of multiple shock collisions within the GRB jet, I will obtain a robust prediction of a minimal diffuse GRB neutrino flux that will likely lie within the reach of the planned detector upgrade, IceCube-Gen2. Finally, I will show preliminary results that could allow us to know whether to expect a significant neutrino signal from a particular GRB, just from the examination of the features of its gamma-ray light curve.