Department of Theoretical Physics

Free Meson Seminar

Speaker	:	Jishnu Dey (Presidency University, Kolkata)
Topic	:	Strange stars, pion gas, hydrodynamics and nuclear, particle and astrophysics
Day, Date & Time	:	Thursday, August 2, 2012 at 2:30 p.m.
Place	:	AG 69

Abstract

There has been the following major progress in three fields which makes Witten's idea of two phases of baryonic matter relevant : normal nuclear matter and strange matter.

(1) A bound for shear viscosity/entropy density was conjectured from a string-like field theory which however can be used for various substances including strange matter at the surface of a strange star at the temperature T = 80 MeV, as we have shown, where the cosmic separation of phases sets in. Fouxon, Betschart and Bekenstein have shown that the bound for shear viscosity/entropy density is valid for many other cases like liquid nitrogen, helium etc., and we also show that for pion gas this bound gets saturated at about T = 80 MeV.

(2) Ultra high energy cosmic rays as seen by the Pierre Auger set up in Argentina can be explained by strange antimatter according to the model of Zhitnitsky and Lawson.

(3) Very precisely determined heavy neutron star masses can be explained by strange quark stars. This may be seen in the recent Nature paper by Demorest et al. where from Shapiro delay a very precise mass 1.97 M_{sun} is found.

(Nilmani Mathur)