THEORETICAL PHYSICS SEMINAR

Title: Heavy quark dynamics in RHIC and LHC

Speaker: Dr. Santosh Kumar Das, University of Catania, Italy

Date/Time/Venue: 17th Feb. 2017 (Friday)/2:30 PM/ Room No. 469

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Tea will be served at 3:30pm outside Room 469
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ABSTRACT

The heavy quarks, charm and bottom, constitutes a unique probe of the quark gluon plasma (QGP) properties. Both at RHIC and LHC energies a puzzling relation between the nuclear modification factor RAA(pT) and the elliptic flow v2(pT) related to heavy quark has been observed which challenged all the existing models. We discuss how the temperature dependence of the heavy quark drag coefficient is responsible to address for a large part of such a puzzle along with the full solution of the Boltzmann collision integral for the momentum evolution of heavy quarks in the medium. Ultra-relativistic Heavy-Ion Collision (HIC) also generates very strong initial magnetic field. Since the heavy quark are produced at the early stage of HICs, we argue that their dynamics will be affected by such a strong magnetic field and we demonstrate that the directed flow, v1 , of heavy quarks is a superior probe to estimate the magnetic field generated in non-central HICs. We show that the resultant effects entail a significantly large v1 of charm quarks which is about two order of magnitude larger than the light quarks v1 and can be measured at experiments.

All are welcome to attend