THEORETICAL PHYSICS SEMINAR

Title: Consequences of f(R) gravity in Randall?Sundrum Model

Speaker: Dr. Sampurnanad Jha, University of Delhi, Delhi

Date/Time/Venue: 8th January (Friday)/2:30 PM/ Room No. 469

Abstract

One of the vexing issues of the standard model of particle physics is
to explain the disparity between the Planck scale and the electroweak
scale. An interesting approach due to Randall Sundrum (RS), does
explain the discrepancy by assuming a 4+1 dimensional world. In this
model, extra dimension is compactified on a circle whose upper half is
identified with the lower half and the known world is confined to one
of a pair of three-branes that sit atop the two fixed points. However,
the value of the compactification radius is treated as a model
parameter and not determined by the dynamics of the model. Such a
degree of freedom violates the equivalence principle.

We point out that the corrections to the gravity sector of the Einsein-
Hilbert action can lead to scalar degree of freedom which, interacting
with the radius field (modulus), results in an effective potential for
it. The effective potential thus obtained is minimized to set a value
of compactification radius. We show that for reasonable values of model
parameters, the hierarchy between the Planck scale and the electroweak
scale can be explained in a modulus stabilized scenario. Further, we
also discuss that the scalar field, that arises naturally in our model,
can be used to explain the magnetic field present on cosmological
scale.

All are welcome to attend