CERN Colloquium

SPEAKER: Dr. Eric ADELBERGER (University of Washington)

TITLE: **A low-energy frontier of particle physics**

DATE: Tue 09/09/2008 16:30

PLACE: Main Auditorium**

ABSTRACT

It is remarkable that small-scale experiments can address important open issues in fundamental science such as: "why is gravity so weak?" and "why is the cosmological constant so small?" I will review recent torsion-balance work that probes string-inspired ideas (large extra dimensions, new low-mass scalar particles and chameleons, non-commutative geometries, etc.). In particular I will discuss Equivalence Principle tests with luminous and dark matter, short-distance tests of the gravitational inverse-square law, and Planck-scale probes of Lorentz symmetry, focusing on the experimental challenges and our strategies for overcoming them. The precision attained in these experiments provides laboratory proof that gravity is the dominant long-range interaction between dark and luminous matter, demonstrates that any extra dimension must have a size smaller than 44 micrometers, excludes natural values for the chameleon mechanism, and probes non-commutative geometries up to a scale of 10^{13} GeV.

Organised by: Luis ALVAREZ-GAUME / PH-TH ----------**

Tea and coffee will be served at 16:00