SEMINARIO DE FÍSICA GRAVITACIONAL

Miercoles 16 de Enero de 2013, 15:30

Finite Quantum Gravity and M-Theory

Abstract: *We hereby present a class of higher derivative theories that realizes an ultraviolet completion of Einstein gravity. This class is marked by a non-polynomal entire function (form factor), which averts extra degrees of freedom (including ghosts) and improves the high energy behaviour of the loop amplitudes. By power counting arguments, it is proved that the theory is (super-)renormalizable in any dimension, i.e. only one-loop divergences survive. Furthermore, in odd dimensions there are no counter terms for pure gravity and the theory turns out to be ``finite''. Consequently, by introducing an infinite tower of massive states coming from dimensional reduction, quantum gravity is finite in even dimension, as well. Comparing these theories with superstring and string field theories, a unique form factor is singled out. In view of this, we can modify the 10-dimensional supergravity and finally get a ultraviolet completion of 11-dimensional supergravity by an ``oxidation process''. The result is a finite ``Quantum M-theory''.*

Leonardo Modesto
Fudan University

Lugar: *Sala de Juntas, Serrano 121*
Centro de Física "Miguel A. Catalán"