Seminario
Departamento de Física Teórica

"Effective quantum gravity: corrections to Newton's potential and the running of fundamental constants in deep IR"

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Abstract:

In the formulation of the effective approach to quantum gravity (QG), the main application is, traditionally, the QG corrections to Newton's potential. We explain why Einstein's gravity may be a universal theory of the low-energy (IR) QG. On top of that, the consistent derivation of the gauge- and parametrization-independent QG contributions to Newton's potential are described. On the other hand, since Einstein's gravity has only massless degrees of freedom, it remains relevant in the deep IR and, in principle, may provide the running of Newton and cosmological constants up to the nowadays cosmic scale. We show that this effect may take place only in the QG theory with a nonzero cosmological constant and, also, requires using the Vilkovisky-DeWitt effective action, which means, extending the basic definitions of quantum field theory.

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