

SEMINARIO
Departamentos de Física Teórica I y II
Universidad Complutense de Madrid

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TITULO: May the force not be with you

LUGAR: FACULTAD DE CIENCIAS FÍSICAS UCM

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ABSTRACT

Many theories of modified gravity can be rewritten as General Relativity plus an additional degree of freedom, interacting with matter through an effective metric, related to the gravitational one by means of a conformal transformation.

I will present recent results generalizing this setup, by allowing the interaction between matter and the field to occur through an effective disformal metric $d_{ab} = A(\phi)g_{ab} + B(\phi)\phi_{,a}\phi_{,b}$ and discuss some simple applications. The presence of a disformal coupling considerably changes the dynamics with respect to the conformally coupled case, giving rise to new phenomena.

When applied to cosmology, the tendency of the field to avoid singularities in the effective metric provides a mechanism to initiate a slow roll phase and source cosmic acceleration. In very dense environments, the equation for the field becomes independent of the energy density of matter, therefore giving rise to a novel disformal screening mechanism.

Reference: 1205.3167