

Theory Seminar

Monday, November 23, 2009 2:10 PM 831 Pupin Hall

The Effective Theory of Quintessence and its Observational Signatures

I will study generic single-field dark energy models, by a parametrization of the most general theory of their perturbations around a given background, including higher derivative terms. In appropriate limits this approach reproduces standard quintessence, k-essence and ghost condensation. There are no general pathologies associated to an equation of state $w_Q < -1$ or in crossing the phantom divide $w_Q = -1$. Stability requires that, when $w_Q < -1$, dark energy behaves, on cosmological scales, as a fluid with a virtually zero speed of sound. Theoretical and stability constraints are summarized on the quintessential plane $(1+w_Q)$ vs. speed of sound squared. Then I will discuss the effect of dark energy with a zero speed of sound on non-linear scales. I study the spherical collapse model and estimate the cluster mass function, finding a distinctive modification at low redshifts. I will also comment about the effect of clustering quintessence on cluster measurements.

Guido D'Amico, SISSA , Italy

