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Seminar of the theory group of APC

Mardi 6 Juin 2017, 14 :00
APC, 483 A - Malevitch
Domaines : hep-th

Titre : *Dark energy without dark energy : Observational tests and theoretical challenges*

Orateur : **David Wiltshire (University of Canterbury, New Zealand)**

Résumé : *I will give an overview of the timescape cosmology. It is assumed that inhomogeneities - voids, walls and filaments - modify the average background geometry of the universe, which is no longer a simple solution of Einstein's equations with homogeneous dust. To obtain a viable phenomenology without dark energy, I provide a framework for interpreting Buchert's backreaction formalism, by revisiting fundamental issues relating to the definition of gravitational energy in a complex geometry. Cosmic acceleration is realized as an apparent effect due both to backreaction and the the relative calibration of the asymptotic clocks of observers in gravitationally bound structures relative to the time parameter that best describes the average statistical evolution. The cosmic coincidence problem is solved directly in relation to the growth of the void fraction.*

Predictions of the timescape phenomenology are very close to the standard cosmology, but with differences which can be tested. I will outline current observational constraints, future tests (e.g., with the Euclid satellite), and also theoretical challenges that need to be overcome for backreaction models to fully compete with the Lambda Cold Dark Matter cosmology.