



ΣΕΜΙΝΑΡΙΟ ΤΜΗΜΑΤΟΣ ΦΥΣΙΚΗΣ

SPECIAL PHYSICS COLLOQUIUM

Thursday, 30 June 2011

17:00 -18:00

3rd Floor Seminar Room

“Cosmological puzzles: the Dark Sector and Theories of Gravity”

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"The General Theory of Relativity (GR) is an astounding accomplishment: together with quantum field theory, it is now widely considered to be one of the two pillars of modern physics. The great success of GR, however, has not stopped alternatives being proposed, some by Einstein himself. The limits of GR have again come into focus with the emergence of the 'dark universe' scenario. For many years there has existed evidence that, if gravity is governed by GR, there should be a substantial amount of dark matter in galaxies and clusters. More recently, dark energy has also been found to be required in order to explain the apparent accelerating expansion of the Universe. Indeed, if GR is correct, it now seems that around 96% of the Universe should be in the form of energy densities that do not interact electromagnetically. Such an odd composition, favoured at such high confidence, has led some to speculate on the possibility that GR may not, in fact, be the correct theory of gravity to describe the Universe on the largest scales. The dark universe may be just another signal that we need to go beyond Einstein's theory. In this talk, I will discuss the difficulties associated with constructing a new theory of gravity. I will present a compendium of theories of gravity and the extent to which they address the theoretical and observational requirements. Finally, I will discuss a Parameterized Framework for testing gravity on Cosmological scales."