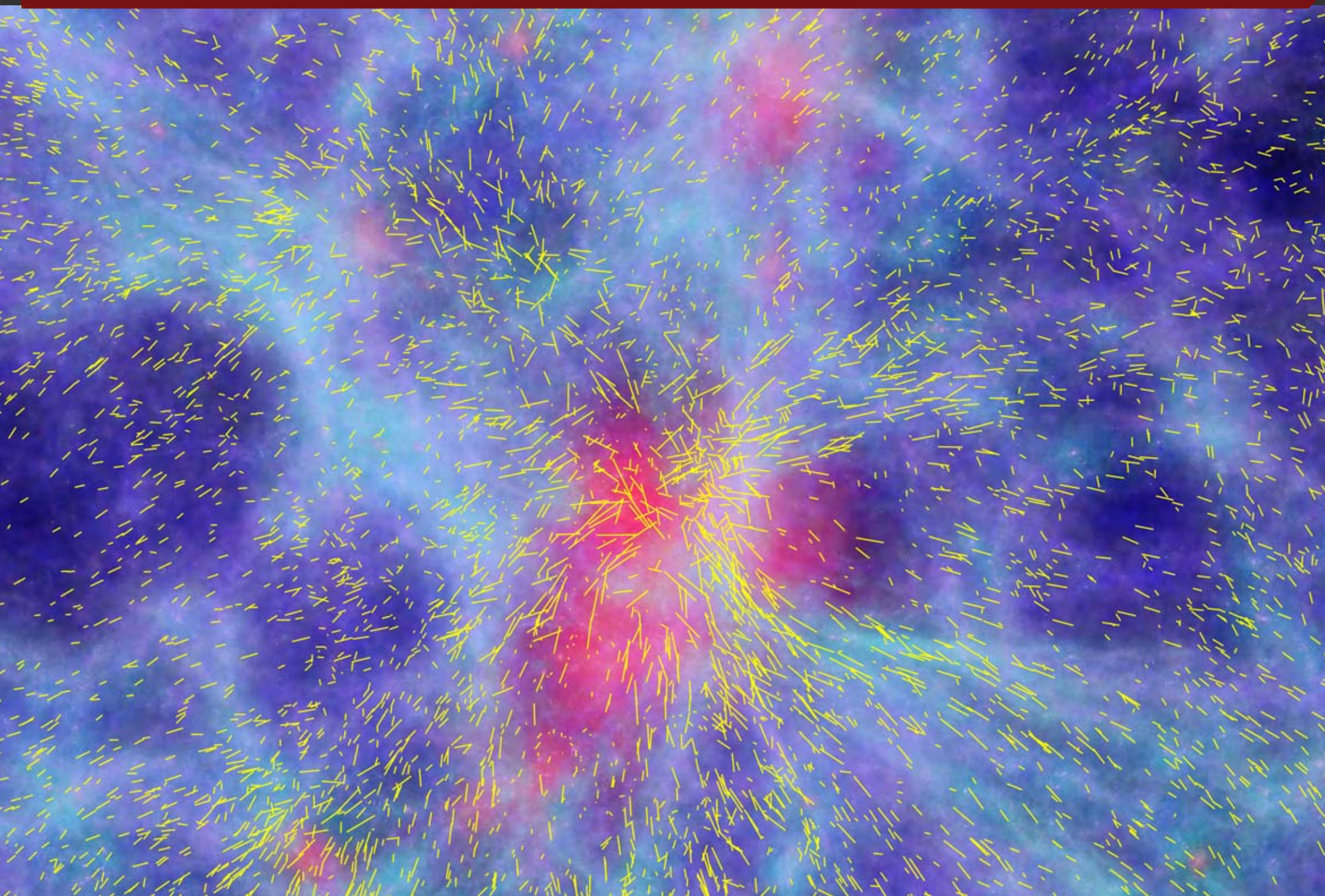




UNIVERSITÀ DEGLI STUDI DI MILANO
SCUOLA DI DOTTORATO IN FISICA
ASTROFISICA E FISICA APPLICATA

2012/2013 PHYSICS COLLOQUIA



After less than fifteen years, the discovery that the Universe is accelerating emerges as one of the turning points in the history of cosmology, as witnessed by the 2011 Nobel Prize in Physics to Perlmutter, Riess and Schmidt. Yet, the origin of the accelerated expansion is a mystery. One possibility is that the Universe is permeated by a "dark energy" which gives rise to a gravitational repulsion. Alternatively, perhaps the very equations of General Relativity need to be modified or generalized to higher-dimensional worlds. In my talk I will first recall the historical developments and review these general ideas. I will then discuss current perspectives for understanding the nature of cosmic acceleration using large surveys of galaxies. Breaking the degeneracy between dark energy and modified gravity requires measuring both the expansion rate and the growth rate of structures. This can be obtained from galaxy redshift surveys, mapping the large-scale distribution and dynamics of galaxies, of which I will show some new examples. Complementarily, one can use large high-resolution imaging surveys from space, to obtain a "tomography" of the distribution of dark matter using the weak-lensing effect. Both these techniques are at the core of Euclid, the recently approved ESA mission that promises to reach percent accuracies on cosmological parameters, with unprecedented control of systematic effects.

11 DEC 2012

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Probing the Mystery of Cosmic Acceleration with Galaxy Surveys

Gli incontri si terranno alle **ore 15:00**
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