Service d'Astrophysique
SÉMINAIRE

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Mardi 04/10/2016, 10h00-11h00

CEA Saclay, Orme des Merisiers Bat 713, salle de sÃ©minaires GalilÃ

INTERPRETING THE TENSION BETWEEN THE CMB AND LARGE-SCALE STRUCTURE WITH HYDRODYNAMICAL SIMULATIONS

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The Planck mission has recently delivered on its promise to obtain few percent level constraints on the fundamental parameters of the standard model of cosmology, the LambdaCDM model.Â In spite of commonly-made claims that "all is well", detailed comparisons to other datasets are beginning to reveal some interesting tensions.Â Measurements of local large-scale structure (LSS) in particular appear at odds with the CMB results.Â A few recent studies have proposed massive neutrinos as a way to reconcile the CMB and LSS measurements.Â However, before arriving at such a strong conclusion (or adopting any other modification of the standard model) we must be certain that we have properly dealt with all important sources of systematic error.Â Precisely modelling large-scale structure is challenging in particular,Â due to the non-negligible effects of feedback processes associated with galaxy formation.Â Here I present the first results from a new large hydrodynamical simulation campaign (BAHAMAS - BAryons and HAloes of MAssive Systems) designed specifically for LSS cosmology purposes and that realistically captures the effects of feedback on LSS.Â A number of the simulations include a massive neutrino component.Â Using virtual observations of the simulations, I re-assess the evidence for tensions between the CMB and various LSS probes, including cosmic shear, CMB lensing, galaxy clustering, the Sunyaev-Zel'dovich effect and so on.Â I then show the effects of massive neutrinos on these various LSS tests and discuss the current evidence for and against their cosmological importance.
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