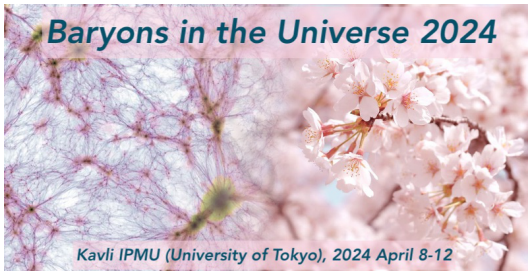

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Can baryonic effects alleviate the 8 tension in weak gravitational lensing surveys?

Friday, 12 April 2024 11:20 (20 minutes)

"Upcoming large-scale structure (LSS) surveys will measure the matter power spectrum to approximately percent level accuracy with the aim of searching for evidence for new physics beyond the standard model of cosmology. In order to avoid biasing our conclusions, the theoretical predictions need to be at least as accurate as the measurements for a given choice of cosmological parameters. However, recent theoretical work has shown that complex physical processes associated with galaxy formation (particularly energetic feedback processes associated with stars and especially supermassive black holes) can alter the predictions by many times larger than the required accuracy.

In this talk, I will introduce SP(k), an analytical model for the effects of baryon physics on the non-linear matter power spectrum based on the ANTILLES large suite of hydrodynamical simulations. Using this model, I will show that the effects of baryons on the matter power spectrum can be understood at approaching the percent level in terms of the mean baryon fraction of haloes, at scales of up to < 10 h/Mpc and redshifts up to = 3.

Through the application of the SP(k) model, I will investigate the compatibility of baryon budget measurements, derived from the latest weak gravitational lensing and X-ray data, with recent findings. These include the cross-correlation between cosmic shear and the diffuse X-ray background from Ferreira et al. (2023), as well as the proposals by Amon & Efstathiou (2022) and Preston et al. (2023), suggesting more aggressive feedback beyond typical simulations to reconcile primary CMB (+BAO+CMB lensing) measurements with low-redshift LSS measurements."

Presenter: SALCIDO, Jaime