Contribution ID: **19** Type: **not specified**

Cosmology with z<2 galaxies at WST

The wide-field spectroscopic survey telescope (WST) project is 12-metre wide-field spectroscopic survey telescope with simultaneous operation of a large field-of-view (3 sq. degree), high-multiplex (20,000) multi-object spectrograph (MOS) and a giant 3⊠3 arcmin integral field spectrograph (IFS).

WST is designed to probe a large volume of the Universe with a galaxy density sufficient to measure the extremely-large-scale density fluctuations required to explore primordial non-Gaussianity and therefore inflation. In addition, combining the spectroscopic surveys with the next generation CMB experiment, WST can provide the first 4sigma measurement of neutrino mass and the first 5sigma confirmation of the neutrino mass hierarchy from astronomical observations. Finally, these high-redshift measurements will probe a Dark Matter dominated era and test exotic models where Early Dark Energy properties vary at high redshift.

We propose to use Lyman Break Galaxies (LBGs) in the 2.0<z<5.5 redshift range as tracers of the matter. These galaxies are selected by using a u/g/r-dropout approach based on a very deep u/g/r-bands that can be provided by imaging surveys such as LSST. In addition, we will present the results of pilot surveys observed in COSMOS and XMM fields by DESI from 2021 to 2024. We will show that we can achieve both the LBG densities and the redshift accuracy required for future spectroscopic surveys such as WST.

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