ID contributo: **25** Tipo: **non specificato**

Cosmology with cluster sizes: measuring the Hubble constant from Planck and XMM-Newton observations of galaxy clusters.

martedì 29 giugno 2021 14:50 (20 minuti)

The most recent analyses of the expansion rate (H_0) of the Universe have approached the one-per cent accuracy during the last two decades. At that precision, however, early-Universe H_0 inferred from the Cosmic Microwave Background (CMB) and local estimation from cosmic distance ladder (Cepheid plus SNIa) significantly differ from one another. Galaxy clusters are alternative cosmic distance rulers that can help to enlighten the CMB-Cepheid tension on the value of the Hubble Constant. Taking advantage of the different dependence with the integrated density of the Intra-Cluster Medium (ICM) between the X-ray bremsstrahlung radiation (quadratic) and the thermal Sunyaev- Zel'dovich effect (tSZ, linear), it is possible to deduce the angular diameter distance of clusters –and the underlying cosmological parameters– from the ratio of the X-ray surface brightness and the tSZ millimetre optical depths. We apply this technique to infer H0 from XMM-Newton and Planck observations of the CHEX-MATE cluster sample, a large tSZ signal-to-noise ratio limited sample of 120 galaxy clusters in the redshift range [0,0.6]. With respects to earlier results based on the Planck Early Release Compact SZ Source Catalogue, the size and selection function of this new sample will allow us in particular to better assess the systematics of the method, including some observational biases or the impact of cluster morphologies.

Autori principali: DE LUCA, Federico (Istituto Nazionale di Fisica Nucleare); Dr. BOURDIN, Hervé (Università degli Studi di Roma "Tor Vergata"); MAZZOTTA, Pasquale (ROMA2); OPPIZZI, Filippo (Istituto Nazionale di Fisica Nucleare)

Relatore: DE LUCA, Federico (Istituto Nazionale di Fisica Nucleare)