10th International Conference on Gravitation and Cosmology: New Horizons and Singularities in Gravity (ICGC 2023)



Contribution ID: 32

Type: Poster

Hubble tension in the light of eLISA/ET: A Three-Pronged Approach with Fisher, MCMC and ML

Cosmology today, although precise, is perhaps not accurate. The so-called tensions in the standard ACDM model have been cited as a crisis in the field. With no clear evidence of systematical errors, nor a foolproof alternative theory as of now, the crisis is often attributed to the insufficiency of data at hand, that calls for future missions. In this presentation, I would investigate the prospects of the future space-based gravitational wave mission eLISA, set to probe the "intermediate" redshifts, in addressing the Hubble tension. I'll demonstrate a three-pronged approach - namely using Fisher matrices (the standard forecasting tool in cosmology), Markov chain Monte Carlo (MCMC) algorithms (the conventional parameter estimation scheme), and a machine learning algorithm like Gaussian processes (for non-parametric reconstruction), to help shed light on this disparity. By considering a few representative cosmological models as fiducials, some of which show promise at varied levels in alleviating the Hubble tension when confronted with current datasets (CMB+BAO+SNIa), we construct realistic mock-catalogs of bright standard siren events. Using these catalogs, I'll then demonstrate the inference of the Hubble constant independently from the three techniques. Finally, a comparative analysis among the methods, as well as the models, would be presented.

This would be based mostly on the work published in JCAP06(2023)038/arXiv:2301.12708.

Email

rahul.shah.13.97@gmail.com

Affiliation

Indian Statistical Institute, Kolkata

Author: Mr SHAH, Rahul (Indian Statistical Institute, Kolkata)
Presenter: Mr SHAH, Rahul (Indian Statistical Institute, Kolkata)
Session Classification: Cosmology

Track Classification: Cosmology