

High-redshift cosmology with intensity mapping

Thursday 23 September 2021 11:35 (15 minutes)

Intensity Mapping (IM) of line emission targets the Universe from present time up to redshifts beyond ten when the Universe reionized and the first galaxies formed, from small to largest scales. Similar to CMB measurements, the power spectra of intensity fluctuations inform about the underlying cosmology; imagine the information encoded in thousands of intensity maps at different redshifts and for multiple emission lines, forming full tomographic lightcones. In this talk I review IM as a test for cosmology and fundamental physics during cosmic dawn and the epoch of reionization. I show how power and cross-power spectra as well as global temperature measurements probe our cosmology, properties of dark matter and of astrophysical sources. The measurement of deviations from the gravitational constant G and a possible dark matter –dark energy coupling are highlighted in general modified gravity scenarios. The ability of upcoming instruments like the SKA to constrain these modifications is demonstrated. If time permits, going beyond 'traditional' summary statistics, I further show how neural networks are able to directly infer e.g. dark matter and astrophysical properties from such tomographic line fluctuation lightcones without an underlying Gaussian assumption.

Do you wish to attend the workshop on-site?

no

Summary

Primary author: HENEKA, Caroline Samantha (not set)

Presenter: HENEKA, Caroline Samantha (not set)

Session Classification: Parallel Sessions: Cosmology

Track Classification: Cosmology & Astroparticle Physics