

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



Contribution ID: 387

Type: **not specified**

Mapping the baryonic Universe: a new window into the cosmos (Invited Talk)

Wednesday 6 December 2023 14:15 (30 minutes)

Mapping the baryonic content of the Universe, especially after the epoch of Cosmic Dawn – the birth of the first stars and galaxies – promises rich insights into both astrophysics and cosmology. The technique of intensity mapping (IM) has emerged as a powerful tool to explore this phase of the Universe by measuring the integrated emission from sources over a broad range of frequencies. A particular advantage of IM is that it provides a tomographic, or three-dimensional picture of the Universe, unlocking significantly more information than we presently have from galaxy surveys. Astrophysical uncertainties, however, constitute an important systematic in our attempts to constrain cosmology with IM. I describe an innovative approach which allows us to fully utilize our current knowledge of astrophysics in order to develop cosmological forecasts from IM. Analytically driven extensions to this framework allow us to interpret the latest auto-correlation IM results from the MeerKAT facility, as well as its counterparts in the microwave and sub-millimetre regimes. The framework can be used to exploit synergies with other complementary surveys, thereby opening up the fascinating possibility of constraining physics beyond Lambda CDM from future IM observations.

Presenter: PADMANABHAN, Hamsa

Session Classification: Workshop on Cosmology