Cosmic Origins and the Search for New Physics

Monday 19 January 2026 - Friday 23 January 2026

Indian Institute of Technology Madras, Research Park

Scientific Programme

The Conference will be focused on the physics related to the early universe. With the detection of gravitational waves by the LIGO-VIRGO collaboration and the stochastic gravitational wave background by the pulsar timing arrays, there has arisen a tremendous scope for constraining the primordial correlations over small scales. During the coming decades, the primordial gravitational waves are expected to be observed over a wide range of frequencies. It has been recognized that these observations will perfectly complement the observations involving the anisotropies and the spectral distortions in the cosmic microwave background, distribution of the large scale structure, and observations of neutral hydrogen, over larger scales. There has been significant theoretical and observational developments in these directions over the last few years, leading to a substantial gain in our understanding of the physics operating in the early universe. In particular, the observations have led to certain cosmic anomalies, which may require new physics to resolve. This Conference is aimed at bringing together experts on the origins of the primordial perturbations and their evolution through the history of the universe to examine if the recent observations point to new physics. The topics that will be covered at the Conference include:
Origin and evolution of primordial perturbations
Sources of primordial gravitational waves and their detection
Primordial magnetic fields and their signatures
Nature and origin of dark matter
Masses of neutrinos and implications for cosmology
Anomalies and tensions in cosmology

Invited speakers