

A robust explanation of CMB anomalies with a new formulation of inflationary quantum fluctuations

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In this talk, we introduce CMB anomalies, especially the hemispherical asymmetry that has been consistently observed by WMAP and Planck data. These anomalies have been extensively discussed in the last decade as a signature of new physics and several scalar field models of inflation have been proposed in this regard. We will present a new understanding of inflationary quantum fluctuations which is model-independent and can robustly explain the hemispherical asymmetry anomaly of the CMB. Based on our approach to the new construction of quantum theory on curved space-time, we also present new predictions with exact numerical values for the CMB temperature fluctuations at low multipoles. We further comment on how one can determine observationally the quantum nature of inflationary fluctuations and how our study will impact the problem of time in quantum cosmology.

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