

Abstract Submitted
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Entanglement and curvature perturbations in the pre-inflationary universe EUGENIO BIANCHI, Pennsylvania State Univ — In the approach to a classical cosmological singularity, metric perturbations at space-like separation decouple. In this talk I discuss a quantum version of this property of classical general relativity. I consider states of the quantum geometry of space which have Planckian curvature and vanishing correlations at space-like separation. These states arise naturally in loop quantum gravity. When taken as initial states for cosmological perturbations, these states lead to a new cosmological scenario in which the entanglement entropy of a region of space grows from zero to an area law during a pre-inflationary phase of the universe. I discuss imprints that these initial states can leave in the primordial power spectrum of scalar and tensor modes.

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