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Entanglement and the architecture of spacetime[1]

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Entanglement is a hallmark of complex quantum systems: When the constituents of a system come into contact, they establish correlations that cannot be explained in terms of classical physics - they become entangled. Spacetime itself is no different. At small scales where quantum effects dominate, the geometry of spacetime manifests its quantum nature. In this talk I illustrate how entanglement plays a fundamental role in the description of the architecture of spacetime. In particular I discuss a scenario for the pre-inflationary state of the universe which is characterized by its entanglement structure and which can leave imprints in the cosmic microwave background.

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