

An inflationary cosmology from Anti-de-Sitter wormholes

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There are various proposals as to what initial state can give rise to an inflationary cosmology. The two most popular ones are the no boundary (Hartle-Hawking) and the tunneling (Vilenkin) proposals. Both of them explain only part of the observations and lead to some paradoxes. In this talk, I will review these proposals and I will propose a novel initial state (wavefunction) of the universe which in the far past has asymptotically AdS boundary conditions. In the semiclassical limit it is a Euclidean wormhole solution that can give rise to an expanding universe upon analytic continuation to Lorentzian signature. This proposal evades some of the issues that plagued the no boundary and the tunneling proposals. Moreover, the asymptotic AdS conditions in the Euclidean past could in principle allow for the description of inflationary cosmologies and their perturbations within the context of holography, leading to microscopic models.

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