Institut Henri Poincaré

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String Theory in Greater Paris

Rencontres Théoriciennes

“Supergravité, théorie des cordes et théorie M”

Jeudi 17 Octobre 2024, 10:00

Panos Betzios

Ghent university

An Inflationary Cosmology from Wormholes

In the context of inflationary cosmology a natural question arises on what precedes inflation itself. We review aspects of the Hartle-Hawking (no boundary) and Vilenkin (tunneling) proposals, and their relation to the Wheeler- DeWitt equation. These raise some paradoxes that are complementary in nature and in clash with observations. On the other hand theories of quantum gravity are better defined in the presence of a negative cosmological constant. I will propose a new type of wave function of the universe with asymptotically AdS boundary conditions in the far (Euclidean) past. In the semiclassical limit, it describes a Euclidean (half)-wormhole geometry with properties that result in an expanding universe upon analytic continuation to Lorentzian signature. In this context some of the aforementioned phenomenological issues can be resolved.

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