Contribution ID: **364** Type: **Invited talk in a parallel session**

Quantum Geometric Models for Early Universe Cosmology

Tuesday, 9 July 2024 16:00 (30 minutes)

We revisit basic problems of classical Friedmann-Lemaître cosmology that motivate the idea of cosmological inflation in light of modern ideas on quantum geometry. Classical cosmology assumes the validity of General Relativity with its smooth Riemannian spacetime geometry at all scales, even below the Planck scale where quantum-gravitational effects are expected to dominate. We argue that models that take the quantum geometry of spacetime below the Planck scale into account are quite generically not affected by the horizon problem of classical cosmology. A slight adjustment of the quantization prescription of quantum field theory leads to a toy model with appropriate symmetries and expected effects of quantum geometry, including fuzzy light cones and non-locality. Preliminary computations show that such models may be relevant not only for the horizon problem but also for the flatness problem.

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Session Classification: Inflation: perturbations, initial singularities and emergent universes

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