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Invited Talk - Covariant entropy bounds in higher derivative theories of gravity - Nilay Kundu, IIT Kanpur

Friday 22 August 2025 12:00 (1 hour)

In this talk we will try to understand how one can argue a classical Bousso bound for higher derivative corrections to general relativity. We will focus on theories for which the higher derivative terms are considered as small corrections in the Lagrangian to Einstein's two-derivative theory of general relativity (GR), we prove the classical version of the covariant entropy bound (also known as the Bousso bound) in arbitrary diffeomorphism invariant gravitational theories. Even if the higher derivative corrections are treated perturbatively, we provide instances of specific configurations for which they can potentially violate the Bousso bound. To tackle this obstruction, we propose a modification in the Bousso bound that incorporates the offending contributions from the higher derivative corrections. We argue that the modified Bousso bound that we propose holds to all orders in the higher curvature corrections. Our proposed modifications are equivalent to replacing the Bekenstein-Hawking area term by Wald's definition for the black hole entropy.

Session Chair : Sachindeo Vaidya