Contribution ID : **64** Type : **Invited Talk**

Generalized Entropy Induces Varying-G

Thursday, 21 May 2026 11:20 (40)

I will review the recently proposed GEVAG (generalized entropy and varying-G) theory. This theory gives a consistent treatment of how the field equation of gravity should be changed if the area law of horizon entropy is modified, namely that gravitational constant G is now area-dependent, the functional form of which depends on the specific modifications of the entropy. Specifically, GEVAG was able to prevent the violation of the Bekenstein bound, known to plague various generalized entropies like Tsallis entropy. When applied to the quantum gravity logarithmic correction, the framework managed to derive a modified Hawking temperature that was previously obtained in the GUP (generalized uncertainty principle) literature, but now without explicitly utilizing GUP. This circumvents the known problems in the GUP literature that heuristic derivations are often unreliable. I will briefly mention how these affect early time cosmology.

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Session Classification : Day 2