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Higgs mass and gravity

Tuesday, September 23, 2025 3:00 PM (30 minutes)

According to usual calculations (both in flat and curved spacetime) the mass of a scalar particle is quadratically sensitive to the ultimate scale of the theory, the UV physical cutoff. Considering a self-interacting scalar theory on a non-trivial gravitational background, I will show that, once due attention is payed to the path integral measure and to the way the UV scale is introduced, the mass of the scalar particle presents only a (mild) logarithmic sensitivity to this scale. This is obtained without resorting to any supersymmetric embedding of the theory, nor to regularization schemes (as dimensional or zeta-function regularization) where power-like divergences are absent by construction. Based on these results, I will present speculations on the way the Minkowski limit should be approached.

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