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Unified emergence of energy scales and cosmic inflation

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In the quest for unification of the Standard Model with gravity, classical scale invariance can be utilized to dynamically generate the Planck mass and the inflation potential. However, the generation of the vastly separated electroweak scale requires further explanation. We use the Coleman-Weinberg mechanism in an additional scalar sector as a unified origin for dynamical generation of both scales. The link to the electroweak scale is established by the neutrino option where the Higgs potential is radiatively generated by right-handed neutrinos and also the active SM neutrinos are given a mass by the type-I seesaw mechanism. The inflationary CMB observables are predicted to interpolate between those of Starobinsky and linear chaotic inflation model.

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