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Hubble Selection of the Weak Scale: possibility from QCD quantum phase transition

During inflation, a scalar field undergoes a quantum diffusion following the de-Sitter temperature. Aided by the greater Hubble rate at higher potential, the quantum diffusion can make the global distribution of the field climb up the potential. If the potential exhibits a criticality at the maximum point, the field distribution can be sharply located near there. We show a possibility from QCD phase transition that it can have a critical point near the weak scale, so that the “Hubble selection” may account for the Higgs hierarchy problem.

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