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## On the Origin of Scales and Inflation

*mardi 17 mars 2015 18:45 (15 minutes)*

This talk will be mainly based on the paper “Agravity” with arXiv number 1403.4226 [hep-ph]

### Summary

We will discuss the possibility that the fundamental theory of nature does not contain any scale. This leads to a renormalizable quantum gravity, which can be reinterpreted as a graviton minus an anti-graviton (agravity). The Planck scale and a flat space can arise dynamically at quantum level provided that the quartic coupling of a scalar and its beta function vanish at the Planck scale; for example, this is how the Standard Model scalar behaves when its mass is around 125 GeV and the top mass is about 171 GeV. Within agravity, inflation is a generic phenomenon: the slow-roll parameters are given by the beta functions of the theory, and are small if couplings are perturbative. Furthermore, the electroweak scale is generated by agravity quantum corrections and can be naturally small compared to the Planck scale. We will also comment on the observational consequences for inflation and the electroweak physics.

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**Classification de Session:** The Scalar Sector

**Classification de thématique:** Theory