

Dimensional Transmutation in Particle Physics and Cosmology

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Models with classical scale invariance (CSI) provides us with a dynamical origin for all masses (via dimensional transmutation) and can account for all evidence of beyond the standard model physics. Furthermore, a general theory with CSI is renormalizable (even in the gravity sector) and can solve the hierarchy problem. The price to pay is a classical ghost. The theory, however, admits quantizations that preserve unitarity and a Hamiltonian bounded from below. The solution of the hierarchy problem implies that the theory can be tested through inflationary data (indeed it predicts a (gravitational) isocurvature mode that could be observed in the next future).

I will give an overview of CSI and introduce the subsequent talks on this subject.

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