Contribution ID: **27** Type: **not specified**

How robust are particle physics predictions in asymptotic safety?

Friday, 9 June 2023 12:15 (15 minutes)

The framework of trans-Planckian asymptotically safe quantum gravity has been shown to give phenomenological predictions for new physics content in simple extensions of the Standard Model. However, it is important to note that this heuristic approach relies on simplifying approximations, including the computation of renormalization group equations at 1-loop, an arbitrary definition of the position of the Planck scale at 10^{19} GeV, and a zero gravitational contribution to the renormalization group equations below the Planck scale and a constant contribution above it.
In this work, we systematically drop each of these approximations and analyze their impact on predictions, both analytically and numerically. For the numerical description we consider two very different extensions of the Standard Model: a gauged $B - L$ model and a leptoquark S_3 model. In the former model, we aim to predict the Yukawa couplings of the right-handed neutrino, the dark abelian gauge couplings, and the kinetic mixing. In the latter model, we aim to predict the Yukawa coupling of the color-charged leptoquark. We present numerical and analytical estimates of the uncertainties within each model.

Presenter: Dr RIZZO, Daniele

Session Classification: Lighting Talks