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Asymptotic safety with N_F flavors

Wednesday, 27 November 2019 14:30 (1 hour)

I will discuss recent developments in calculating beta functions of a generic gauge-Yukawa theory augmented by N_F flavors of heavy vector-like fermions. In the limit of large N_F it is possible to reorder the perturbative expansion with 1/N_F as ordering parameter, and then resum the tower of loop diagrams with ever-increasing number of vacuum-polarization bubbles at the leading order in 1/N_F. The resummed expression is finite and presents a pole at a non-perturbatively large value of the coupling. When applied to the gauge beta function, this mechanism can allow one to generate an interacting UV fixed-point and, for gauge symmetry groups not containing an abelian component, give rise to an asymptotically safe theory. Some possible applications of these constructions might pertain to flavor model building.

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