ID de Contribution: **5**   Type: **Non spécifié**

Conformal window 2.0 (Oleg Antipin)

mardi 3 octobre 2017 10:00 (45 minutes)

We extend the phase diagram of SU(N) gauge-fermion theories as function of number of flavours and colours to the region in which asymptotic freedom is lost. We argue, using large Nf results, for the existence of an ultraviolet interacting fixed point at sufficiently large number of flavours opening up to a second ultraviolet conformal window in the number of flavours vs colours phase diagram. We first review the state-of-the-art for the large Nf beta function and then estimate the lower boundary of the ultraviolet window. The theories belonging to this new region are examples of safe non-abelian quantum electro dynamics, termed here safe QCD. Therefore, according to Wilson, they are fundamental. An important critical quantity is the fermion mass anomalous dimension at the ultraviolet fixed point that we determine at leading order in 1/Nf. We discover that its value is comfortably below the bootstrap bound. We also investigate the abelian case and find that at the potential ultraviolet fixed point the related fermion mass anomalous dimension has a singular behaviour suggesting that a more careful investigation of its ultimate fate is needed.