Excited QCD 2014



Contribution ID: 97

Type: not specified

Many-flavour QCD and the conformal window

Monday 3 February 2014 18:30 (30 minutes)

As the number of flavours in QCD is increased beyond some threshold, chiral symmetry is restored and longdistance physics becomes scale invariant. The region of parameter space in which this happens is called "conformal window". The phenomenology of theories in the conformal window or close to it is very different from real-world QCD, and clearly shows how rich gauge theories can be. As these theories are inherently non-perturbative, lattice simulation provide a unique setup to investigate them from first principles. In this talk I will review the main results and open questions in this field, the challenges ahead, and the techniques used.

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