



Contribution ID: 250

Type: **Invited talk**

Linear Sigma EFT for Nearly Conformal Gauge Theories

Thursday 2 August 2018 15:00 (30 minutes)

I discuss using a generalized linear sigma model as an effective field theory (EFT) to describe nearly conformal gauge theories at low energies.

The work is motivated by recent lattice studies of gauge theories near the conformal window, which have shown that the lightest flavor-singlet scalar state in the spectrum (σ) can be much lighter than the vector state (ρ) and nearly degenerate with the PNCBs (pions) over a large range of quark masses.

The studies have also revealed that the flavored scalar states (a_0) may be lighter than the ρ . The EFT naturally incorporates these features. I highlight the crucial role played by the terms in the potential that explicitly break chiral symmetry. The explicit breaking can be large enough so that a limited set of additional terms in the potential can no longer be neglected, with the EFT remaining weakly coupled and usable in this new range. The additional terms contribute importantly to the scalar and pion masses. In particular, they relax the inequality $M_\sigma^2 \geq 3M_\pi^2$, which is incompatible with current lattice data.

Authors: INGOLDBY, James (Yale University); LATTICE STRONG DYNAMICS (LSD) COLLABORATION

Presenter: INGOLDBY, James (Yale University)

Session Classification: Strongly Coupled Theories

Track Classification: G: Strongly Coupled Theories