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A Guide to Anomaly-Mediated Supersymmetry Breaking QCD

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Recently it has been demonstrated that anomaly-mediated supersymmetry breaking (AMSB) is a valuable tool for understanding the low-energy phases of non-SUSY gauge theories. For example, applying AMSB to SUSY SU(N) gauge theories with quarks in the fundamental leads to scalar potentials with chiral symmetry breaking minima. Furthermore, the application of AMSB to a class of SUSY SO(N) gauge theories gave the first analytic demonstration of confinement, via the dual Meissner effect, and continuous chiral symmetry breaking in a non-SUSY gauge theory. In this talk I will review these developments and then begin an exploration of the rich moduli space structure of AMSB-deformed SU(N) gauge theories. In particular, SUSY-broken gauge theories often possess baryonic runaways to incalculable minima with field VEVs of order Lambda_QCD. For a large class of theories, we instead find that the naive tree level runaways are stabilized by AMSB loop effects. This provides good evidence that the chiral symmetry breaking minima found in the small SUSY breaking limit are in fact global minima.

Authors: GOMES, Andrew Wesley; NOETHER, Bea; CSAKI, Csaba (Cornell University); ROY VARIER, Digvijay (University of California, Berkeley); MURAYAMA, Hitoshi; Dr TELEM, Ofri (UC Berkeley)

Presenter: GOMES, Andrew Wesley

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