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# KMI Theory Seminar

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“Twelve massless flavors and three colors  
below the conformal window”

Prof. Julius Kuti  
UC San Diego

Wednesday, November 2, 2011; 16:30-17:30,  
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## Abstract:

We report new results for a frequently discussed gauge theory with twelve fermion flavors in the fundamental representation of the  $SU(3)$  color gauge group. We subject the model to opposite hypotheses with respect to the conformal window. In the first hypothesis, below the conformal window, we test chiral symmetry breaking. In the second test, for the alternate hypothesis inside the conformal window, we probe conformal behavior driven by a single anomalous mass dimension under the assumption of unbroken chiral symmetry at vanishing fermion mass. Our results at fixed gauge coupling, based on the assumptions of the two hypotheses we define, show low level of confidence in the conformal scenario with leading order scaling analysis. Relaxing the important assumption of leading mass-deformed conformality with its conformal finite size scaling would require added theoretical understanding of the scaling violation terms in the conformal analysis.