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On the classification of 4d rank1 N=2 SCFT

Friday, 7 August 2015 16:00 (20 minutes)

I will report on a systematic approach to the classification of four dimensional N=2 superconformal field theories (SCFTs) with a one dimensional moduli space of Coulomb vacua with planar topology. The geometric structure of the Coulomb branch encodes ultraviolet conformal field theory data: the relevant mass deformations of the UV N=2 SCFTs are mapped to the complex deformations of singular Coulomb branch geometries. Our results go beyond the standard lore of the ADE classification, and a richer pattern of flavor symmetries is revealed corresponding to different deformations.

We have constructed explicit Seiberg-Witten (SW) curves and one-forms for each possible regular deformation. Further physical consistency conditions are obtained by considering N=2 RG flows, and certain SW geometries are ruled out by our conjecture about the absence of dangerously irrelevant operators in N=2 field theories. All but one of the surviving SW geometries correspond to known N=2 SCFTs; we conjecture that the new geometry corresponds to a previously undiscovered rank 1 N=2 SCFT.

The structure of the enhanced Coulomb branches (also known as mixed branches) of these N=2 SCFTs is also examined in terms of N=1 chiral ring relations. The related data (i.e., the dimension of the Higgs branch factor) is used to compute the conformal and flavor central charges by a refined version of Shapere and Tachikawa's topological twisting argument.

Oral or Poster Presentation

Oral

Primary author: LV, Yongchao

Co-author: Prof. ARGYRES, Philip (University)

Presenter: LV, Yongchao

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