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Rigid Superconformal Field Theories in three dimensions

Wednesday, 28 September 2016 17:15 (15 minutes)

I'll talk about my work with J. Distler (to appear) in which we study a class of 3d N=4 superconformal field theories and their mass deformations. We perform this study by establishing a relation between the geometry of the vacuum moduli spaces of these theories and (a refined version of) the "Theory of sheets" which is an important subject in Geometric Representation Theory. This realizes in a precise way an earlier proposal of Chacaltana-Distler-Tachikawa about such a relationship. These three dimensional theories are related to the codimension two (or four dimensional) defects of the six dimensional (0,2) theory of type A,D,E (sometimes called theory X[j]) by dimensional reduction. Understanding the mass deformations of these three dimensional theories is the first step in understanding the mass deformations of a general class S theory. One of the surprises that arise in our study is the existence of Rigid N=4 SCFTs in three dimensions. These are non-trivial SCFTs that do not admit an ordinary mass deformation. I'll describe the Coulomb and Higgs branches of Rigid SCFTs and the implications of their existence for the study of mass deformations.

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