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Classification of 4d rank 1 N=2 SCFTs

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We present a classification of 4d rank 1 $\mathcal{N} = 2$ Superconformal Field Theories (SCFTs), based on a geometrical analysis of the Coulomb Branches of these theories, i.e., their moduli space of vacua.

Supersymmetry and the residual $U(1)$ gauge symmetry on the Coulomb Branch allow us to constrain the geometries that can be consistently interpreted as low energy moduli space of a SCFT.

The same scale invariant geometry can correspond to multiple SCFTs, differing by the structure of their flavor symmetry, realized in the low energy description as different matter content.

Our analysis consists in starting with scale invariant Coulomb Branch geometries and classify the possible deformations of such geometries, thus determining the allowed set of rank-1 $\mathcal{N} = 2$ SCFTs with their corresponding flavor algebras.

Summary

Author: LOTITO, Matteo (University of Cincinnati)

Co-authors: Dr MARTONE, Mario (University of Cincinnati); Prof. ARGYRES, Philip (University of Cincinnati); Mr LU, Yongchao (University of Cincinnati)

Presenter: LOTITO, Matteo (University of Cincinnati)

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