"N=2 Superconformal field theories from mixed branches and VOAs"

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Abstract: I will first present an overview of Superconformal Field Theories (SCFTs) focusing particularly on the analysis of the moduli space of vacua of N=2 SCFTs in 4 dimensions. After reviewing the relation of such theories coming with 2d non-unitary conformal theories and the algebraic constraints which follow, I will outline a possible classification scheme. This is mostly based on a recently discovered new structure underling N=2 SCFTs which ties together the corresponding VOA with specific information of the moduli space of vacua, namely the mixed branch geometry and the number of symplectic leaves of the Higgs branch. This in turn might enable a systematic construction of all N=2 SCFTs with a minimal set of inputs.