4D to 3D reduction of Seiberg duality for $SU(N)$ susy gauge theories with adjoint matter: a partition function approach

Carlo Sana – *matricola* 726409
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Supervisor: Silvia Penati *Assistant supervisor*: Alberto Zaffaroni

In each branch of physics strongly coupled systems represents a challenge because the lack of approximation methods available makes their analysis very difficult.
In the last twenty years we assisted to the discovery of many dualities in high energy physics between strongly coupled theories with weakly coupled ones, which can be studied with perturbative methods. AdS/CFT and Seiberg duality are the strong-weak dualities that gained the most attention because of their broad range of applicability. Seiberg duality is also called electric-magnetic duality because it shares some features with the duality between electric and magnetic fields in the Maxwell's equations discovered by Dirac. Generally, Seiberg duality associates to an *electric theory*, which is a non-abelian supersymmetric gauge theory, a dual theory, the *magnetic* one.