

Seiberg Duality

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The way quarks are bound to nucleons is described in principle by Quantum Chromodynamics (QCD). The real QCD has three colors and three light flavors, called up, down, and strange. It is a basic unanswered question to find the behavior when the number of colors and flavor are changed. Seiberg solved this question in the supersymmetric case, by introducing his duality in 1994. The basic statement is the equivalence of the theory with N_c colors and N_f flavors and the theory with $N_f - N_c$ colors and N_f flavors, but the equivalence appears in different physical guises depending on the ratio of N_c and N_f , as shown in more detail in the figure below. This discovery of Seiberg duality was a seminal, decisive step that gave rise to the modern non-perturbative study of supersymmetric field theories in general.

