
Seminario INFN

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terrà il Seminario:

Geometry from supersymmetric field theory with 8 supercharges

Abstract: In quantum field theories without supersymmetry, ground states ("vacua") are believed to come in continuous families ("moduli spaces") if and only if some continuous internal symmetry is spontaneously broken, and the flat directions of the potential are in one to one correspondence with Nambu-Goldstone bosons. Instead, supersymmetric quantum field theories (SQFTs) typically have moduli spaces of supersymmetric vacua beyond the implication of Goldstone's theorem, with geometric structures dictated by the amount of supersymmetry. After reviewing these general ideas, I will focus on SQFTs with eight fermionic conserved charges and on their so called hypermultiplet moduli spaces, which geometrically are (often singular) hyperKähler manifolds, or (holomorphic) symplectic singularities. I will review three constructions of such mathematical objects arising from physics: one well known since the 1980s, one understood in the last ten years following work of mine with Hanany and Zaffaroni, and one yet to be fully understood from QFT first principles.

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