

Classical and quantum aspects of N=1 heterotic G2 compactifications

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Supersymmetric flux compactifications of string theory are coupled system of gauge theory and gravity. In all such systems, the interplay between gauge fields, flux and geometry makes it non-trivial to determine the deformation theory that governs the compactification moduli. In this talk, we explore this question in N=1 compactifications of the heterotic string on 7D G2 structure manifolds. We will present a classical deformation theory for these systems, that rely on an elliptic double complex, that we will explicitly construct. This will allow us to compute infinitesimal moduli and their obstructions. Our analysis is governed by a real superpotential, which we determine by dimensional reduction. Finally, we will outline the computation of the one-loop partition function of the heterotic G2 system, and how it decomposes into a product of one-loop partition functions of Abelian and non-Abelian instanton gauge theories.

Presenter: LARFORS, Magdalena