Heterotic flux vacua with a small superpotential

Lucas Tsun Yin Leung*[1]

[1]Department of Physics [Oxford] – Parks Rd, Oxford OX1 3PU / Keble Rd OX1 3RH, United Kingdom

Abstract

Although many models with a standard model spectrum exist in the smooth Calabi-Yau heterotic compactification landscape, the stabilisation of moduli remains an underdeveloped topic. In this talk, we study heterotic CY compactifications with NSNS three-form flux in view of moduli stabilisation and investigate whether the value of the flux superpotential evaluated at supersymmetric minima can be small. The absence of a no-scale structure in heterotic implies that a non-vanishing flux superpotential generically induce a tree-level scalar potential for all moduli, and controlled moduli stabilisation hence requires the value of the flux superpotential should be sufficiently small to compete with non-perturbative effects. I will highlight new progresses in this direction, and present two no-go theorems regarding supersymmetric vacua with small superpotentials in moduli space. I will also present a numerical analysis of flux superpotential values in regions of moduli space not forbidden by the no-go theorems where the period structure is explicitly known, and highlight the stringent constraints on values of heterotic flux superpotentials.

Keywords: heterotic smooth compactification, moduli stabilisation

*Speaker