

de Sitter constructions in String Theory



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Uplifting Runaways and the Tadpole Problem

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I will discuss a mechanism which can lead to a possible instability of the KKLT construction for de Sitter vacua. The sphere at the tip of a warped deformed conifold throat can be destabilized by antibranes placed in the throat. Consequently, the stabilization of moduli should not be treated independently from the antibrane uplift in KKLT-like scenarios. A similar bound can be found for numerically constructed Klebanov-Strassler black holes.

This conifold destabilization mechanism can be avoided by turning on a large amount of flux on the sphere, but tadpole cancellation constraints the hierarchy of scales in a type IIB flux compactification. Even though sufficiently large tadpole bounds can be realized in string theory, they always come at the expense of a large number of moduli. The stabilization of these moduli by fluxes contributes to the tadpole condition as well, reducing the maximal flux on the KS-throat. I will discuss this problem for the example of M-theory on $K3 \times K3$.

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