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Algorithmically solving the Tadpole Problem

Monday 14 December 2020 18:35 (5 minutes)

I demonstrate how to use differential evolutionary algorithms to find flux compactifications of M-theory on K3xK3. The assumption that large numbers of moduli can be stabilized with fluxes within the tadpole bound is one of the corner stones of the String Landscape. However, showing moduli stabilization for manifolds with many moduli explicitly is highly challenging. On K3xK3 moduli stabilization is well understood and can be formulated exclusively in terms of integer matrices and their eigenvalues and -vectors. In particular, there is no knowledge of complicated period integrals or the corresponding Picard-Fuchs equations required. This makes this example predestined for a computer aided search. Using differential evolution we show that there are no smooth compactifications on K3xK3 with arbitrarily small flux M2-charge, in tension with the tadpole bound.

Presenter: Dr LUST, Severin (Harvard University)

Session Classification: Short talks