The Cosmological Constant Problem and Dark Dimensions from Non-Susy Strings

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Abstract

I will present an explicit string theory construction in which the particle physics contributions to the one-loop vacuum energy exactly cancel, whilst the gravitational contributions are suppressed in the size of one or two large extra dimensions. This provides an ultraviolet realisation of the Dark Dimension and Supersymmetric Large Extra Dimensions scenarios, with, moreover, an explanation as to why the Standard Model contributions to the vacuum energy cancel without the need of eV mass-splittings. A moduli stabilisation scenario in which all moduli are fixed, with the Dark Dimensions exponentially large in the inverse string coupling, is also proposed. Based on 2512.20570 in collaboration with Emilian Dudas and Marco Serra.

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