Bucharest 2025 PhD School: "Modern Methods in Quantum Gravity and Cosmology"

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Dark Dimension Cosmology

Abstract: I will discuss first the swampland distance conjecture and the Dark Dimension proposal for the cosmological constant. I will then argue on the possibility that compact extra dimensions obtain large size by higher dimensional inflation, relating the weakness of the actual gravitational force to the size of the observable universe. Although this can be realised for any number of extra dimensions, the requirement of (approximate) flat power spectrum of primordial density fluctuations consistent with present observations makes this simple scenario possible only for extra dimensions of micron scale. This can then be nicely combined with the Dark Dimension proposal.