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[colloquium] Physics of A Naturally Small Cosmological Constant

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After discussing the necessary condition for a naturally small cosmological constant, I present a string theory motivated supergravity model that satisfies this condition. This leads to the axi-Higgs model that offers a resolution to the Hubble tension, the Lithium puzzle in big bang nucleosynthesis and the isotropic cosmic birefringence, with predictions to be tested in the near future. For the sake of completeness, the model is extended to achieve an explicit realization of a naturally small cosmological constant, where the electroweak scale (~ 100 GeV) emerges automatically.

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