Hyperbolic compactification of M theory and accelerated expansion

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Negative curvature manifolds are generic, including infinite sequences of hyperbolic manifolds with known metric. Their positive tree-level contribution to the potential energy and their rigidity properties, along with the stabilizing effects of the warp factor, make them well-suited for string/M theory compactification. This fits with empirical observations, which indicate positive potential energy generating accelerated expansion in the early and late universe, with significant constraints on low energy supersymmetry. In this talk we review recent work with De Luca and Torroba developing de Sitter and inflationary models in this setting. Along the way, we will describe ongoing work on repurposing cosmological models for machine learning optimization, and its application to solving PDEs (including those arising in string/M theory compactification).

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