

Physics Colloquium

Prof. Liam McAllister
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“The Cosmological Constant and the Quantization of Parameters”

I will argue that the fundamental parameters in Nature are integers. In string theory these integers record the topology of six additional spatial dimensions. The task for theorists is to understand what values these numbers can take, and how experimental observables can be expressed in terms of them. A key observable is the dark energy density, which is 123 orders of magnitude smaller than the naive prediction from theory: this discrepancy is the famous cosmological constant problem. We have learned how to compute the fundamental integers in a vast class of geometries, and have used this knowledge to construct solutions of string theory in which the dark energy density has an allowably small magnitude. But it has the wrong sign! I will explain why our result constitutes progress on a toy model of the cosmological constant problem.

Prof. Liam McAllister was an undergraduate at Harvard, studying physics and mathematics. He earned his Ph.D. at Stanford in 2005, then carried out postdoctoral research at Princeton. In 2007 he joined the faculty at Cornell, where he is now a Professor of Physics. Prof. McAllister is known for his work on cosmological solutions of string theory.

Thursday, September 23, in LL 316 at 4:25 PM

For Zoom participation, please see information below:

Meeting ID: 972 1274 7894

Passcode: 631869