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**Vacuum decay: from cosmology to cold atoms**

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**ABSTRACT**

Vacuum decay is a prominent example of strongly nonlinear effects in quantum field theories, with potentially important implications for cosmology, relating to phase transitions in the early universe or the supposed metastability of the current Higgs vacuum. Although a general theoretical description was laid out in the 70s by Sidney Coleman and his collaborators, fundamental questions pertaining to the back-reaction of true vacuum bubbles on space-time curvature and their correlations remain so far unanswered, calling for different approaches to the problem. In this talk, after a brief review of Coleman’s theory emphasizing its genericness and limitations, I will present a recently-proposed cold-atoms model in which some of these ideas could be tested in laboratory experiments. I will discuss the mathematical correspondence between the two problems and focus on how a localized defect changes the decay rate, taking the example of a vortex in a Bose-Einstein condensate and comparing with the effect of a black hole in a relativistic theory.