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Seminar of the theory group of APC

Mardi 18 Décembre 2018, 14 :00
APC, 646 A - Mondrian
Domaines : hep-th

Titre : *Testing relativistic vacuum decay with cold atoms*

Orateur : **Florent Michel (Durham University)**

Résumé : *Vacuum decay is a prominent example of strongly nonlinear effects in quantum field theory 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 80s 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.*