



Universidad del País Vasco  
Euskal Herriko Unibertsitatea  
The University of the Basque Country

## Seminarios de Física Teórica Fisika Teorikoa: Hitzaldiak

# Quantum Vacuum and Dark Energy

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**Abstract** The relation between dark energy and vacuum energy in QFT is not so straightforward as widely assumed. In particular, we shall show that the Casimir energy in compact topologies of space is not related to the cosmological term of the effective action. We point out the existence of a renormalization ambiguity in spaces with non-vanishing curvature. The ambiguity is related to the well known ambiguity of the  $R^2$  term of the gravitational effective action. However, there are some extra universal contributions which are genuine dependent on the topological structure of the space and completely independent of the renormalization scheme. We show that they have a pure topological non-local origin and are not related to the cosmological constant term. We illustrate the results with explicit calculations for massless fields in many space topologies.

Seminar Room, Dept. of Theoretical Physics, Corridor 4.-2.

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Time:11:40