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# Lifetimes of (near) eternal false vacua

## Content

I'll explain some examples of long-lived false vacua in quantum field theory that arise from so-called 'universes'. These false vacua are protected by a  $(d-1)$ -form global symmetry, where  $d$  is the dimension of spacetime, and their lifetimes can be made parametrically long even when the difference in energy density between the false and true vacua is large compared to the natural scales of the field theory. This sounds exotic, but it can happen in very familiar QFTs, and I'll talk about examples based on abelian gauge theories in two dimensions as well as four-dimensional QCD. In both cases, it is possible to view the  $(d-1)$ -form symmetries as arising from a modification of the sum over instantons.

## Title

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