

# Whispers from the Dark Universe - Particles & Fields in the Gravitational Wave Era

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## WHISPERS FROM THE DARK UNIVERSE – PARTICLES & FIELDS IN THE GRAVITATIONAL WAVE ERA

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## A quantum improved description of false vacuum decay via the 2PI effective action formalism

*Wednesday 25 September 2024 17:38 (17 minutes)*

False vacuum decay is believed to have played an important role in the history of the universe, in particular in the context of phase transitions in the very early universe. As such, a microscopic understanding of the process is crucial to our ability to make predictions. In this talk, we review the traditional instanton method for the computation of the false vacuum decay rate, and we improve it by embedding it in the 2PI effective action formalism. In particular, we show how the formalism is capable of correctly capturing the quantum corrected spectrum of fluctuations, and is therefore a powerful tool to deal with softly broken symmetries and quasi-zero modes.

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