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Probing UV-completion via Gravitational Waves: Pecei-Quinn Phase Transition

Wednesday 26 May 2021 17:00 (15 minutes)

Attempts to solve naturalness by having the weak scale as the only breaking of classical scale invariance in 4-dimensional Quantum Field Theories satisfy Total Asymptotic Freedom (TAF): the theory holds up to infinite energy, where all coupling constants flow to zero and is devoid of any Landau poles. Specifically we will discuss a fundamental field theory of the QCD axion in the totally asymptotically free (TAF) scenario, and the dynamics of the Peccei-Quinn (PQ) phase transition there-in. The PQ phase transition can be of strongly first order and produce stochastic gravitational waves (GW) background within the reach of GW detectors, with predictions in a frequency peak in the range
100-1000 Hz with an amplitude that is already within the sensitivity of LIGO \& advanced LIGO.

Summary

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