

NEW PERSPECTIVES IN
CONFORMAL FIELD THEORY AND GRAVITY

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Gravitational waves from QCD-triggered conformal symmetry breaking

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Classically scale-invariant Standard Model extensions predict an intriguing thermal history of the early universe. In contrast to the common paradigm, the onset of the electroweak phase transition can be significantly delayed while the universe undergoes a period of thermal inflation. Then, a first-order QCD chiral phase transition could not only trigger electroweak symmetry breaking but also initiate the exit from supercooling. I will outline how such a scenario arises naturally in a large class of scale-invariant Standard Model extensions. Then, I will discuss how to study the transition dynamics by means of effective QCD models. Finally, the gravitational wave signal from the chiral phase transition in a supercooled universe is presented. While a large amount of latent heat is naturally involved if thermal inflation ends, a supercooling period prior to the QCD scale considerably enhances the timescale of the transition. This enhancement implies great observational prospects at future observatories.

Summary

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