THE CHINESE UNIVERSITY OF HONG KONG

Department of Physics

SEMINAR

NanoGrav Signal & Primordial Black Hole from Modified Higgs Inflation

by

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Place: Rm 311, Science Centre North Block, CUHK

ALL INTERESTED ARE WELCOME
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Abstract

This study investigates the classical Higgs inflation model with a modified Higgs potential featuring a dip. We examine the implications of this modification on the generation of curvature perturbations, stochastic gravitational wave production, and the potential formation of primordial black holes (PBHs). Unlike the classical model, the modified potential allows for enhanced power spectra and the existence of PBHs within a wide mass range 1.5×10^{20} g – 9.72×10^{32} g. We identify parameter space regions that align with inflationary constraints and have the potential to contribute significantly to the observed dark matter content. Additionally, the study explores the consistency of the obtained parameter space with cosmological constraints and discusses the implications for explaining the observed excess in gravitational wave signals, particularly in the NANOGrav experiment. Overall, this investigation highlights the relevance of the modified Higgs potential in the classical Higgs inflation model, shedding light on the formation of PBHs, the nature of dark matter, and the connection to gravitational wave observations.