

第1回 国立清華大学・茨城大学 ジョイント・セミナー (物理)

日時 : 10/30(火)14:30-16:00 (JST)

場所 : オンライン

Abstract

Kingman Cheung 氏 (Department of Physics, National Tsing Hua University)

Primordial Black Hole from Modified Higgs Inflation & NanoGrav Signal

Primordial black hole (PBH) is a hypothetical object that can arise from density perturbation. We study a modified Higgs inflation model featuring a dip in the Higgs potential. Such a modified potential can generate curvature perturbation for CMB and large enough curvature perturbation for PBH formation, as well as the stochastic gravitational wave. We identify parameter space regions that align with inflationary constraints and have the potential to generate enough PBHs to account for the observed dark matter content. Additionally, we explore the possibility that can explain the observed excess in gravitational wave signals, particularly by the NANOGrav experiment.

百武 慶文 氏 (茨城大学)

Title : Higher derivative corrections in M-theory

Superstring theories and M-theory are candidate for the quantum theory of gravity. Especially, as a quantum effect, it is investigated that superstring theories contain corrections to supergravities. These are called higher derivative corrections, and R^4 terms (Riemann tensor to the 4th power) in type II superstring theories and M-theory are well known. In this talk, we briefly review the nature of the string theory and M-theory, and consider higher derivative corrections in M-theory from the viewpoint of local supersymmetry. Especially we focus on terms which consist of 4-form flux terms, such as $(DF)^4$.