



THE CHINESE UNIVERSITY OF HONG KONG
Department of Physics
SEMINAR

Black Holes beyond General Relativity and Their Gravitational-Wave Signatures

by

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Date: November 25, 2021 (Thursday)

Time: ~~4:30 - 6:30 p.m.~~ 5:00 - 6:00 p.m.

Place: Rm G25, Science Centre North Block, CUHK

Join ZOOM Meeting: <https://bit.ly/3mEkz6F>



ALL INTERESTED ARE WELCOME

Abstract

Gravitational waves from black hole binaries bring us a unique window into extreme gravity phenomena that will allow us to perform high-precision tests of GR. However, in this talk I will address a more ambitious question: could we observe signs of modified gravity using gravitational waves? I will focus on the case of higher-derivative corrections to Einstein's theory, which are well-motivated from the viewpoints of effective and fundamental theory. I will first introduce a general family of higher-derivative theories and I will show how the Kerr metric is modified by these corrections. Regarding GW observations, the quantities most sensitive to higher-derivative corrections are the black hole's quasinormal modes, which rule the gravitational waves emitted by a perturbed black hole. Obtaining these quasinormal modes is a very challenging problem in the case of rotating black holes beyond GR, but I will report recent progress in this direction and discuss future prospects.