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Department of Physics
SEMINAR

Strong Lensing of Gravitational Waves: A New Probe of Cosmology and the Nature of Dark Matter

by

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Date: August 8, 2025 (Friday)

Time: 5:00 – 6:00 p.m.

Place: Rm 311, Science Centre North Block, CUHK

ALL INTERESTED ARE WELCOME

Abstract

Gravitational-wave (GW) observations have opened an entirely new window onto the universe. While propagating from the source to detectors, GWs can be deflected by intervening massive objects such as galaxies and galaxy clusters. This is known as gravitational lensing. A small fraction (0.1-1 %) of the detectable GW signals will be strongly lensed, producing multiple images. Proposed third-generation detectors, during their operational lifetime (10 years), are expected to detect roughly millions of GW events annually, with tens of thousands being strongly lensed. We develop a method to measure cosmological parameters and investigate the nature of dark matter using the abundance and time delays of strongly lensed GWs. We also explore potential systematic errors, and prospective constraints on cosmological parameters and nature of dark matter.