中央大學物理學系
Department of Physics, National Central University



Colloquium

CHRONOS: Low-Frequency Gravitational-Wave Science with a Cryogenic Torsion-Bar Speed Meter

Prof. Mario Juvenal S. Onglao III

National Institute of Physics (NIP), University of the Philippines – Diliman (UPD)
Center for High Energy and High Field Physics, NCU



Date: 2026/12/01 (Tue)
Venue: S4-625
Time: 14:00

Abstract :

CHRONOS is a proposed gravitational-wave detector in Taiwan designed to explore the 0.1–10 Hz band. Its science goals range from searching for gravitational waves from intermediate-mass black hole binaries to studying changes in Earth's gravitational field, including the prompt gravity signals produced by earthquakes. The detector uses two crossed cryogenic torsion bars and an optical speed meter that measures their relative angular velocity. This approach can suppress the effect of radiation-pressure back-action at low frequencies.

On behalf of the CHRONOS Collaboration, I will present the science case and detector concept, then describe two recent milestones in our prototype program. We have implemented feedback control of five degrees of freedom and reconstructed the prototype's equivalent strain from a green-laser readout. I will conclude with our plans to integrate the green and infrared readouts and to reduce thermal noise through upgrades to the suspensions and mirror coatings.