



Dr. George Winstone

**Center for Fundamental Physics
Northwestern University**

***Searching for high frequency gravitational waves
and new physics with novel levitated
optomechanical systems***

Date: 2023/02/16 (Thu)

Venue: S4-625

Time: 10:00-11:30

Abstract:

I will present an update on the Levitated Sensor Detector - (LSD) project at Northwestern, an experiment to detect high frequency (10-100Khz) gravitational waves with a microdisk suspended in a cavity. The near term initial science run of the instrument will be discussed, as will future improvements to the sensitivity and noise floor, these will be placed into context of requirements to observe novel physics. We will also discuss the prospect of constructing a global network of detectors in this frequency band. As a secondary benefit, the unique geometry of the levitated test masses developed for LSD may enable a wide variety of hybrid optomechanical systems in an extremely novel regime moving forward. Such as optically levitated micro circuits, and micro scale cavities with optically levitated end mirrors. I will discuss plans for realising these systems and the applications they might enable.