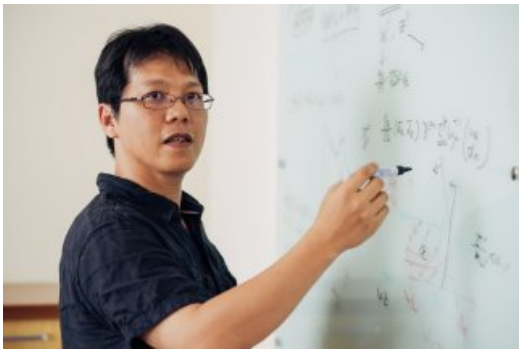
THE CHINESE UNIVERSITY OF HONG KONG

Department of Physics

COLLOQUIUM

Vacuum Noise Squeezing and Its Application to The Gravitational Wave Detector and On-Chip Quantum Circuits

by



Professor Ray-Kuang LEE (李瑞光教授)
Institute of Photonics Technologies
National Tsing Hua University, Taiwan

Date: *October 25, 2019 (Friday)*
Time: *4:00 - 5:00 p.m.*
Place: *L2, Science Centre, CUHK*

(Light refreshments will be served at SCNB 1/F lobby from 3:30 to 3:50 p.m.)

ALL INTERESTED ARE WELCOME
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Abstract

In this talk, I will report our recent implementation of squeezed vacuum states at 1064 nm. With a bow-tie, optical parametric oscillator cavity, and our home-made balanced homodyne detectors, noise reduction up to 10dB below the vacuum is measured. With the operation of a 300 m filter cavity prototype installed at the National Astronomical Observatory of Japan, application of such a vacuum squeezed state to the gravitational wave detector, in order to achieve a broadband reduction, will be discussed. At the same time, based on the niche of silicon photonics technologies and semiconductor industries in Taiwan, we will also introduce our new project toward the implementation of scalable quantum photonic chips by integrating photonic qubits (single photon source, entangled photon pair, squeezed light), optical components based on silicon photonics, and photon detector arrays (single photon avalanche diode, homodyne detector).

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