Old Dominion University
Department of Physics

Colloquium

Tuesday, November 1, 2016

"The Dynamical Casimir Effect, and the Possibility of Laser-like Generation of Gravitational Radiation"

Raymond Chiao
University California, Merced

Abstract: In the Dynamical Casimir effect (DCE), an oscillating mirror, which acts like a moving piston, can do work upon vacuum fluctuations in the empty space between it and a fixed, parallel mirror, such that the motion of the mirror can amplify these fluctuations into detectable radiation, in the process of parametric amplification. We propose an experiment to detect the radiation generated in an initially empty high Q superconducting radiofrequency (SRF) cavity by the action of a flexible superconducting membrane which is driven into motion by pump microwaves filling an identical high Q pump SRF cavity on the other side of the membrane. Above a certain threshold, laser-like action occurs, in which detectable radiation will build up exponentially with time in the empty cavity.

Presentation: OCNPS 200 @ 3:00 pm
Refreshments: OCNPS Atrium @ 2:30 pm

All interested persons are cordially invited to attend.