Seminar

Coupling nanomechanical motion to electromagnetic fields through the Casimir effect

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地点： 理科五号楼607会议室

Abstract

The miniaturization of mechanical devices opens new opportunities for investigating and exploiting novel phenomena that occur for components in close proximity.The Casimir force, for example, originates from the zero-point quantum fluctuations of the electromagnetic fields. I will describe experiments that demonstrated the Casimir effect in micromechanical devices. In the first experiment, we measured the Casimir force on a silicon surface with strong deformations at the nanoscale. The measured force is found to be 20% larger than the pairwise addition of van der Waals force, demonstrating the non-trivial dependence of the Casimir force on the shape of the interacting objects. In another experiment, we measured the Casimir force on a single silicon chip, in the absence of external objects. Apart from providing a compact platform for Casimir force measurements, this scheme also opens the possibility of tailoring the Casimir force using lithographically defined components of non-conventionalshapes.

About the Speaker

Ho Bun CHAN got his B. A. in physics from Princeton University in 1993 and his Ph.D in physics from Massachusetts Institute of Technology in 1999. In 1999, he joined Bell Laboratories, first as a postdoc and subsequently as a staff. In 2004, he became an assistant professor of physics in University of Florida. In 2009, he became an associate professor. Since 2010, he has been an associate professor of physics at the Hong Kong University of Science and Technology.