

Optics and Spectroscopy with Metallic Nanoparticles



RESEARCH CENTER FOR APPLIED SCIENCES—SEMINAR

Prof. Pui-Tak Leung

Professor, Department of Physics.
Portland State University, USA

Thursday, 1 August, 2013

15:30-17:00

**R1101, 11F, Bldg. for Humanities & Social
Sciences, Academia Sinica**



Abstract

An overview of our recent theoretical studies in several optical/spectroscopic phenomena with metallic nanoparticles (MNP) will be presented. These will include (1) the Purcell effect, (2) surface enhanced Raman scattering (SERS), and (3) the Goos Hanchen effect. In (1), we will focus on how the lifetime of a fluorescing molecule is affected via its interaction with a MNP, and a clarification of its various decay rates (radiative and nonradiative rates) will be provided. In (2), we shall present some of our recent results on SERS from a molecule-MNP system in the presence of extraneous charges on the MNP surface; and in (3), we shall study the nonlocal optical effects on the lateral movement of a reflected light beam from a composite made up of MNP's. We shall see that while it is well-known that these nonlocal effects are significant when the size of a MNP goes down below about 10 nm, a composite of these particles serves as a system with manifestation of these effects which makes them easily detectable.