RICE

NSF IGERT IN NANOPHOTONICS
Department of Electrical and Computer Engineering

SEMINAR

Dr. Louis Brus

Chemistry Department
Columbia University
New York, NY

Electromagnetic Field Enhancement near Ag Nanocrystals: Single Molecule Raman Spectroscopy, Optical Forces, and Surface Photochemistry

Abstract:

Two 30nm Ag nanocrystals exhibit junction a junction "hot spot" in their local electromagnetic field enhancement when separated by a few nm. If the a molecule is chemisorbed in the junction and also electronically resonant with the laser, this enhancement is sufficient to enable single molecule Raman spectroscopy. The laser-induced ac polarization in the Ag which creates the "hot spot" also creates a very strong attractive potential between the nanocrystals that squeezes the junction. We calculate these optical forces by integration of the Maxwell stress tensor. The Ag local field enhancement can also be used for photochemistry, to control the shape of Ag nanocrystals growing via surface photoreduction of Ag ion.

March 23, 2006
Keck Hall, Room 100
4:00 p.m. to 5:30 p.m.

Reception follows immediately afterwards in the Keck Hall Foyer

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