

# SINAM NANO SEMINAR

Center for Scalable and Integrated  
Nano Manufacturing (SINAM)

presents



## Nano-particle Plasmons for Field-Enhanced Microscopy and Spectroscopy

**Dr. Javier Aizpurua - DIPC, San Sebastian, Spain**

Monday, March 12, 2007

3:00 - 4:00 pm

3110 Etcheverry Hall

(Pre-seminar cookies and refreshments provided at 2:45 PM)

### Abstract

Collective oscillations of valence electrons in metallic materials, also known as plasmons, determine the optical response of these materials. The energy and strength of these surface oscillations are a function of the shape, size and coupling of the nanoparticles. With the use of the boundary element method (BEM), we solve Maxwell's equations to calculate light scattering and surface modes in nanostructures that are commonly used as hosts and/or samples in different field-enhanced scanning probe microscopies and spectroscopies. The light scattering and near field distribution of particles such as nanorings, nanorods, nanodisks, or nanowires are calculated and interpreted in terms of the plasmon modes supported by the nanosystems. The results are related for each case with different spectroscopic experiments and connected with the capabilities of these structures to host biomolecules and perform the corresponding spectroscopy. Special emphasis is placed on the near-touching limit for pairs of spherical particles to understand recent experiments.

### About Dr. Aizpurua

Dr. Javier Aizpurua holds a Ph.D in Physics from Euskal Herriko Unibertsitatea / University of the Basque Country. He has been a Research Fellow at the Foundation Donostia International Physics Center, DIPC, since 2004, and previously held a position as a Guest researcher in the Atomic Physics Division at the National Institute of Standards and Technology NIST, Gaithersburg, MD (USA).

**\*\*\*View the full abstract and bio for this seminar at <http://www.sinam.org>\*\*\***

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