

# Colloquium Notice

## Viktor Podolskiy

Princeton University, Dept. of Electrical Engineering

### *Novel optical phenomena in metallic nanostructures: plasmon modes, localization and left-handed media*

The optical response of the nanostructured metallic composite could be dramatically different from the response of bulk metal due to resonant excitation of plasmon polariton modes. The spectral characteristics of these modes are strongly affected by the geometry of composite.

In random metal-dielectric percolation films plasmon modes are localized in subwavelength areas with spatial dimensions about 100 nm, so-called "hot spots". Resonant excitation of such localized modes leads to huge enhancements of local linear and nonlinear fields. Due to random structure of the percolation composite, such field enhancement exists in the broad spectrum range, from near UV to mid-infrared, opening a way to the important applications in spectroscopy, biophysics and related areas.

Excitation of polariton modes in composite of metal nanowire pairs, leads to the possibility of construction of left-handed media in the optical and near IF frequency range. One of the most promising applications is the construction of "perfect" lens with subwavelength resolution in the far field.

Monday

**October 27, 2003**

Starts at 12:15 PM

Coffee at 12:00 PM

Physics Conference Room, SB B326