

# BIOLOGY COLLOQUIUM

Monday, January 23, 2012  
3:15 PM, Room 111, Life Sciences

*“DNA-Directed Self-Assembly of Nanoparticle Arrays and  
Biosensing Applications of Fluorescent Metallic  
Nanoclusters”*

Dr. Jaswinder Sharma  
Center for Integrated Nanotechnologies  
Los Alamos National Laboratory

Recently, noble metal nanoparticles have received great attention due to their unique optical and electronic properties. These properties depend upon the particle (composition, size, and shape), refractive index of the surroundings, and the interparticle distance. Exploitation of these properties can develop many functional devices such as solar cells, artificial antennas, and biosensors. For most of these applications, it is necessary to organize the nanoparticles with full control of interparticle distance and geometry of organization. DNA nanotechnology has emerged as an excellent approach to organize metallic nanoparticles at nanometer scale with predetermined geometries and interparticle distances. One key approach is the utilization of DNA scaffolds for organizing metallic nanoparticles. In particular, several strategies to strengthen the gold nanoparticle-oligonucleotide bond and increase in the yield of nanoparticle organization have been developed. Additional efforts concerning the biotemplated synthesis and biosensing applications of fluorescent metallic nanoclusters will also be discussed.