

# SINAM NANO SEMINAR

Center for Scalable and Integrated NANO  
Manufacturing (SINAM) - NSF Nanoscale  
Science and Engineering Center Presents:



## Gold Nanoparticles Tools for Biosensing and Optoelectronics

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**Friday, April 9th, 2010**  
**3:15 PM - 4:30 PM**  
**3110 Etcheverry Hall**

### Abstract

Gold nanoparticles interact strongly with their immediate nanoenvironment. They manipulate their surrounding as fluorescence quenchers [1], or local heaters [2] or they are apt to shift the fluorescence spectra of fluorophores via the Purcell effect[3]. In turn, they are influenced by their surrounding e.g. by the refractive index [4] or by chemical surface damping[5]. These effects may be used in a variety of applications ranging from biosensing [6] to optoelectronics[5,7].

- [1] E. Dulkeith et al. *Physical Review Letters*, 89(20), 203002 (2002) and *Nano Letters* 5, 585 (2005) and *Nano Letters* 7, 1941 (2007)
- [2] J. Stehr et al. *Nano Letters*, 8(2), 619-623 (2008) and C. Hrelescu et al. to be published in JPCC as part of the Martin Moskovits Festschrift.
- [3] M. Ringler et al. *Phys. Rev. Lett.* 100, 203002 (2008)
- [4] G. Raschke et al. *Nano Letters* 3, 935 (2003) and *Nano Letters* 4, 1853 (2004)
- [5] S. Dondapati et al. under review.
- [6] T. A. Klar, *Biosensing with Plasmonic Nanoparticles*, in *Nano-Plasmonics*, V.M. Shalaev and S. Kawata, Editors. 2007, Elsevier: Amsterdam.
- [7] J. Müller et al. *APL* 81, 171 (2002).

### Biography

Thomas A. Klar received a diploma in physics from Ludwig-Maximilians-Universität München (LMU) in 1997 and worked on a PhD thesis at the Max-Planck-Institute for Biophysical Chemistry, Göttingen, Germany from 1997 to 2001. After 6 years as an Assistant at the Photonics and Optoelectronics group at LMU and frequent visits to the School of Electrical and Computer Engineering, Purdue University, West Lafayette, IN, USA, he received the *venia legendi* in 2007. The same year he was appointed Associate Professor at the Technical University of Ilmenau. Dr. Klar is a member of the German Physical Society (DPG), the Materials Research Society (MRS) and the European Optical Society (EOS). In 2001 he received the Helmholtz award together with S. Hell for their work on sub-Abbe resolution in far field microscopy. His current research interests include spectroscopy of hybrid systems containing noble metal nanoparticles, colloidal semiconductor quantum dots and / or organic fluorophores.

### *Refreshments Provided*

Hosted By: Professor Xiang Zhang, 3112 Etcheverry Hall  
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