



Nanotechnology Seminar Series

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"Nanoscale Plasmonic Heterostructures"

Friday, October 27, 2006

3:30 PM

Birck Nanotechnology Center, Room 1001

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Surface plasmons are electromagnetic modes that are present at the interface of a metal and dielectric material. Depending upon the structure of the metal, surface plasmons demonstrate a wide range of characteristics, such as optical field enhancements, tunable resonances, and the ability to propagate in films or be confined at nanoparticle defects. As a result, surface plasmons continue to generate growing interest for new sensor technologies, energy transport, and photonics applications. In many cases, the most interesting advantages of surface plasmons lie in the optical near-field, significantly below the diffraction limit of conventional optics in at least one dimension. This requires novel methods for imaging the spatial profile and propagation properties of surface plasmons, as well as novel spectroscopies for studying photochemistry of heterostructured materials in the near-field. In this talk, recent efforts in our group for the imaging and spectroscopy of plasmonic heterostructures are discussed. Specific examples include plasmonic continuum spectroscopy, metal nanoparticle photoluminescence, the use of photoresponsive polymers for near-field optical imaging, and coherent coupling of molecular excitons to surface plasmons.

Gary Wiederrecht, received a B.S. in chemistry in 1987 from the University of California, Berkeley and a Ph.D. in physical chemistry from the Massachusetts Institute of Technology in 1992. His thesis research was in the area of ultrafast pulse shaping and spectroscopy of soft phonon modes in organic and inorganic ferroelectric crystals. He joined Argonne as a postdoctoral fellow in 1992, and in 1995 became a staff member specializing in ultrafast spectroscopy of photoinduced electron transfer reactions. He is currently a Chemist and Group Leader of the Nanophotonics Group in the Chemistry Division and Acting Group Leader of the Nanophotonics Group in the Center for Nanoscale Materials. His current research is focused on the near-field and far-field spectroscopies of metallic and hybrid organic-metallic nanostructures, with an emphasis on their nanophotonic and charge storage capabilities.

Host: Vladimir Shalaev/Samuel Gresillion ECE Department, (49855, shalaev@purdue.edu)

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