

CBC SEMINAR ANNOUNCEMENT



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Design of metallic nanoparticles for advanced optical applications

Our research focuses on the development of metallic particles of 150 nm of typical size. These particles (gold mainly) are made by electrons beam nanolithography. We are interested in various aspects : fundamental studies and applications, on theoretical and experimental parts. Some of these aspects will be presented :

1. We use them to develop highly sensitive surfaces for SERS and SEIRA-based sensors of chemicals (traces of pollutants) or biological species (proteins). Examples of improvement for technology transfer will be presented (non polarization sensitivity for usability, mechanical robustness and higher optical sensitivity, two frequencies resonances nanostructure patterns suggested for better specificity).
2. We have engineered new shapes of these metallic nanoparticles which symmetry properties permit an efficient second harmonic generation, following a strategy that have been previously applied to molecular systems. In particular gold nanostars and gold-silver nanocylinders, which form respectively a three-fold symmetry and an asymmetric 1D structure such as in a molecular diode, exhibit a significant SHG efficiency.
3. Their size is intermediate between nano and bulk, so one cannot consider them smaller than the wavelength. The structure of the modes inside the nanoparticle is then usefull to understand its optical properties. We are adapting an irreducible tensors formalism for the description of these modes to define an unequivocal language for light-matter interaction with these nanoparticles.

Date:	7th August 2012 (Tuesday)
Time:	2:00pm – 3:30pm
Venue:	NTU SPMS CBC Building Level 2, Conference Room
Host:	Asst Professor Tan Howe Siang