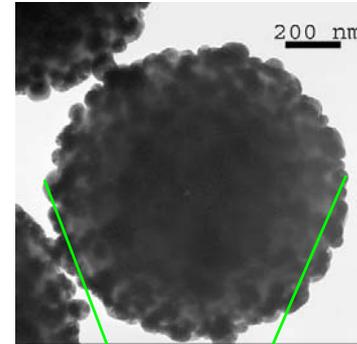
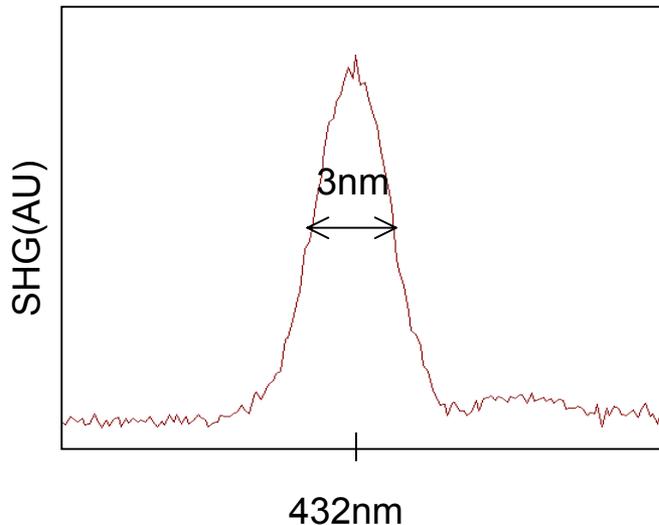


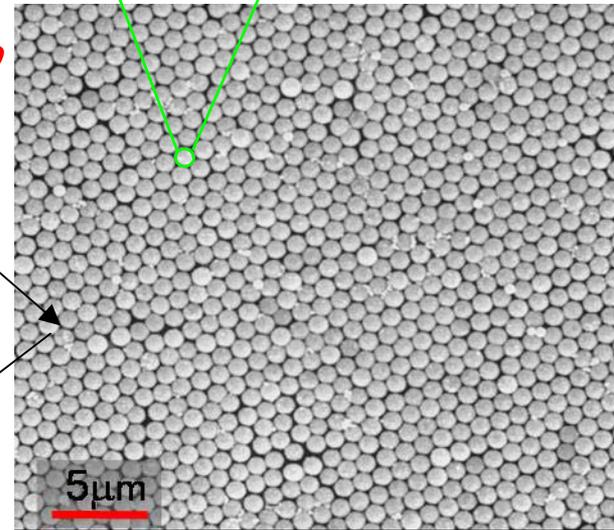
Self-Assembled Metallo-Dielectric Photonic Crystals for NLO

Miriam Deutsch, University of Oregon, DMR-02-39273

Metallo-dielectric photonic crystals synthesized via self assembly of silica spheres coated with Ag nanoparticles exhibited strong frequency doubled signals. Normally, metal-coated colloids do not form ordered structures, due to their large surface-roughness and strong interparticle forces. However, we observed that spheres coated such that the metal shell is rough, yet on the average uniform in thickness, readily form ordered single layers. Surface roughness may act to assist crystallization by introducing local fluctuations in the electrostatic potential which may counter balance van der Waals attraction between spheres.



Colloidal silica sphere coated with granular silver via electroless plating



Monolayer of self-assembled coated spheres

Self-Assembled Metallo-Dielectric Photonic Crystals

Miriam Deutsch, University of Oregon, DMR-02-39273

Education:

Two undergraduates (Daniel Cassell and Ann Randolph), and four graduate students (Jason Bouwman, Molly Emmons, Charles Rohde and Aiqing Chen) are contributing to this work. Ann Randolph was an NSF REU Fellow for the summer of 2002 and has graduated from Carthage College, (Wisconsin) in 2003. Daniel Cassell will be graduating from the University of Oregon in 2004. Jason Bouwman is an NSF IGERT Fellow and is a fourth year Chemistry graduate student. Molly Emmons is the recipient of the NSF GK-12 fellowship. She is currently a second year Chemistry graduate student. Charles Rhode is a third year Physics graduate student. He was an NSF IGERT fellow during the 2002-2003 academic year. Aiqing Chen is a second year Physics graduate student.