

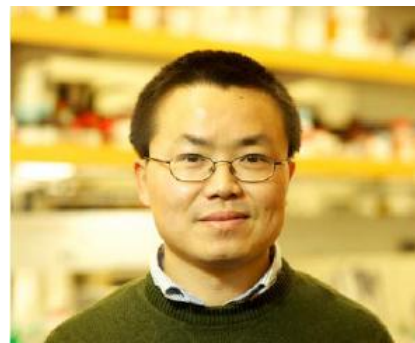
Seminar

Title: Magnetically Responsive Photonic Nanostructures

Speaker: Associate Prof. Yin Yadong
University of California Riverside, USA

Time: 2:00-3:30 (pm) Sep. 6, 2011 (Tuesday)

Place: Meeting room 308, IPE Mansion



Abstract

In this presentation I will introduce our recent work on the fabrication of magnetically tunable photonic nanostructures through a self-assembly approach. Superparamagnetic iron oxide colloidal particles are synthesized by using a high temperature hydrolysis reaction, and then self-assembled into ordered photonic crystal structures in solution phase using external magnetic fields. The colloids form chain-like structures with regular interparticle spacing of a few hundred nanometers along the direction of the external field so that the system strongly diffracts visible light. The balance between attraction (magnetic dipole interaction) and repulsion (electrostatic force) dictates interparticle spacing and therefore optical properties. By changing the relative strength of these two forces, we can tune the peak diffraction wavelength over the entire visible spectrum. By controlling the surface properties of the magnetic particles so that the repulsive forces involved, we have been able to assemble the photonic structures in water, alcohols, and nonpolar solvents. The fast, reversible response and the feasibility for miniaturization impart these photonic materials great potential in applications such as optoelectronic devices, sensors, and color displays.

Introduction

Yin Yadong received B.S and M.S degree in the University of Science and Technology of China (USTC). In 2002, he got the Ph.D in the University of Washington (UW). From 2003 to 2005, he was the postdoctoral fellow in the University of California (UC) at Berkeley and the Lawrence Berkeley National Laboratory. Then he worked as Assistant Professor in UC. In 2011, he was promoted as Associate Professor in UC. He had been published 129 papers in Nature, Science, Adv. Mater, Nano letters, Angew. Chem and Journal of the American, Chemical Society(JACS).