



Yale Institute for Nanoscience and Quantum Engineering

Friday, October 21, 2011

12:00 to 1:00 p.m.

**J. Robert Mann, Jr. Engineering Student Center
10 Hillhouse Avenue - Dunham Lab 107
Light lunch will be served at 11:45 a.m.**

Michael Rooks

**Sr Research Scientist & Assoc Dir Research Facilities, YINQE
Faculty of Arts and Science, Yale University**

“ Microscopy and Nanofabrication Facilities in the YINQE Lab ”

The latest news about instrumentation in the YINQE lab will be presented, along with a virtual tour of the facility. Use of the YINQE facility has increased dramatically in the last year, with a diversification of academic departments and external users. Electron-beam lithography has become the second most popular tool, supporting research programs in optics, quantum computing and mesoscopic physics. E-beam nanolithography laboratory exercises have been developed for inclusion in nanofabrication courses. A new FEI Osiris TEM is now being installed and tested. We will give an up-to-the-minute status report, as well as the details of acoustic shielding, electromagnetic shielding, seismic stability, temperature control and drift. Even more instruments, such as XPS and liquid AFM, are becoming available through our connection with CRISP. A discussion of user suggestions and the future of YINQE will be encouraged.

Eric R. Dufresne

**John J. Lee Associate Professor
Departments of Mechanical, Chemical, Physics and Cell Biology
School of Engineering and Applied Sciences, Yale University**

“Can Dumbbells Make Smart Materials? Optical and Interfacial Properties of Nonspherical Janus Particles”

We have developed a new approach to the synthesis of polymer colloids that produces large quantities of uniform particles with flexible control of particle geometry and surface chemistry. Specifically, we produce dumbbell shaped particles with sub-micron dimensions. The surface chemistry of each of the particles lobes can be controlled somewhat independently. Exploiting the asymmetric dielectric polarizability of these particles, we create suspensions that combine attractive properties of liquid crystals and photonic crystals. By manipulating the wetting properties of the two lobes, we create amphiphilic particles behaving as surfactants that robustly stabilize oil-water interfaces.

HOST: Professor Paul Fleury