Yale Institute for Nanoscience and Quantum Engineering

Friday, 20 April 2012, 12:00 to 1:00 pm

MASON LAB ROOM 211

Light lunch will be served at 11:45 a.m.

Divine Kumah

Postdoctoral Associate, Applied Physics, Yale University

"Materials Discovery with Synchrotron X-Rays"

Understanding the relationship between the atomic structure and the physical properties of materials is a key foundation for the field of material science. Nondestructive techniques to determine the structure of materials have vastly improved over the past few decades. In particular, the development of synchrotron sources which produce high intensity x-rays has enabled the structural determination of nanoscale systems with picometer (10^{-12}m) scale resolution. This talk will illustrate the application of synchrotron diffraction to elucidate the atomic structure and polarization of ultrathin oxide films grown by molecular beam epitaxy. The results are used to understand the origin of polarization coupling between film and substrate and have provided guidance for the development of novel electronic devices.

Professor Tarek Fahmy

Department of Biomedical Engineering

School of Engineering & Applied Science, Yale University

"Multimodality Nanoparticles for Imaging and Therapy"

Abstract: Nanoparticle technologies have experienced rapid growth toward the goal of clinical applications in the treatment and diagnosis of disease. While the inherent potential of these technologies to enhance ttherapy in the clinic is on the horizon, the ability to non-invasively visualize the site-specific delivery of therapeutics remains a highly sought after goal. Toward this goal, the design of multifunctional nanoparticles has emerged as an attractive means to satisfy both therapy and non-invasive imaging. Here, we discuss two examples involving self-assembly of nanoparticles into therapeutic/diagnostic "theranostic" systems, incorporating optimal characteristics for intelligent delivery of therapeutics and noninvasive multimodal imaging.