

Organic devices: What can characterization with synchrotron radiation contribute?

Frontiers in Chemical Imaging Seminar Series

Presented by...

Harald Ade, Ph.D.

Professor and Director of Graduate Programs, North Carolina State University
Department of Physics



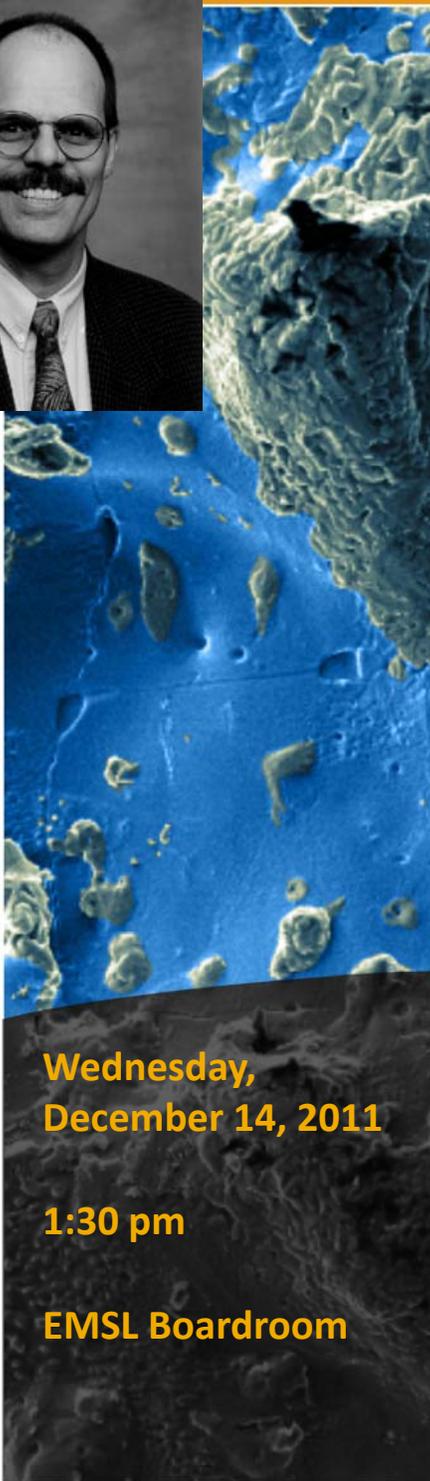
Abstract

Conjugated, semi-conducting polymers have tremendous potential for use in cheap, flexible, lightweight devices and have been widely studied in thin film transistors (TFTs), light emitting diodes, and photovoltaics. Such devices offer the potential to create cheap energy, consume less energy, or be simply cheaper and more practical. Despite great empirical advances during the recent past and a rapidly growing research community, fundamental understanding of device function is still lacking in many instances. The relationship, for example, between structure, processing, and device performance is still unclear in PBTTT-based TFT devices.

Recent work at Advanced Light Source BL 11 has -- for the first time -- uncovered a fundamental relationship between the lengthscale of the *correlation of the polymer backbone orientation* as measured with resonant scattering and saturation mobility. Ade will discuss these results and other important issues that could be resolved and important questions that are raised by recent advances in instrument and method development utilizing tunable soft x-rays. Deeper understanding has been achieved in all three classes of devices. These examples highlight how soft x-ray characterization can impact materials science and exemplify how the nano-scale is connected to the real world through mesoscopic structures.

Bio

Harald Ade has held appointments at North Carolina State University. He has received several awards, including an R&D 100 Award, the K. F. J. Heinrich Award of the Microbeam Analysis Society, a DuPont Young Faculty Award, and AAAS Fellow. He has delivered more than 170 invited presentations and written or co-written over 145 research papers.

A large, vertical, blue-tinted microscopic image showing a textured surface with various irregular shapes and features, likely a polymer or material structure.

**Wednesday,
December 14, 2011**

1:30 pm

EMSL Boardroom