**Interface structure of semiconducting polymer films probed with synchrotron radiation**

Chris McNeill  
Professor  
Materials Science and Engineering & ARC Future Fellow  
& VESKI Innovation Fellow  
Department of Materials Science and Engineering  
University of Monash

Semiconducting polymers are interesting materials that are being developed for a wide range of applications including polymer solar cells, polymer field-effect transistors and polymer light emitting diodes. The thin film microstructure of semiconducting polymers strongly influences the performance of such devices. Being long chain molecules with a planar backbone, the in-plane orientation of polymer chains and their “edge-on” vs. “face-on” orientation are important in determining device function. For polymer field-effect transistors, since charge transport occurs with a few nanometers of the polymer/dielectric interface, interface structure is critically important.

In this presentation I will describe the application of synchrotron radiation to study interface structure in semiconducting polymer thin films. In particular, studies utilizing near-edge X-ray absorption fine structure (NEXAFS) spectroscopy and grazing incidence wide-angle X-ray scattering (GIWAXS)
will be presented showing the solution-processed semiconducting polymers can exhibit surface microstructure that is distinct to the film “bulk.” Such knowledge is important in being able to critically assess the impact of film microstructure of device function.

Bio
Chris McNeill joined the Materials Science and Engineering Department in March 2011. He has a PhD in experimental physics, with five and a half years post-doctoral research experience working at the Cavendish Laboratory at the University of Cambridge. His interests include organic electronic devices such as polymer solar cells and organic field-effect transistors, as well as structural characterization of organic semiconductor films using synchrotron-based techniques. He has been awarded a number of high-profile fellowships including an EPSRC Advanced Research Fellowship to support his work in Cambridge, an ARC Future Fellowship and a veski innovation fellowship to enable him to establish his research activities in Australia.