

國立中央大學數學系

專題演講

主 講 人：孫亞賢教授 (國立中央大學化學工程與材料工程學系)

演講題目：**Probing Block Copolymer Nanostructures Supported on a Solid
Substrate with Grazing Incidence Small Angle X-ray Scattering**

演講茶會：2019年10月31日(星期四) 3:30 p.m. ~ 4:00 p.m.

茶會地點：中央大學鴻經館M306

演講時間：2019年10月31日(星期四) 4:00 p.m. ~ 5:00 p.m.

演講地點：中央大學鴻經館M107

Abstract：

The surface morphology and lateral ordering of micellar assemblies on a substrate are generally addressed with direct imaging techniques involving a scanning electron microscope (SEM) and an atomic force microscope (AFM), but these techniques provide a localized view of the structural information with limited statistics and lack the ability to probe buried and inner structures within a film. In contrast to use of an AFM or SEM, Grazing-incidence small-angle X-ray scattering (GISAXS) is a powerful tool to probe a surface or interface and buried nanostructures in thin films, such as islands on a substrate or buried nanoparticles within a film. The detectable length with X-ray scattering in a grazing-incidence geometry covers a range from less than 1 nm to hundreds of nanometers. Measurement of relief islands on a substrate or objects buried within a film near the critical angle of the substrate decreases the bulk scattering from the substrate. Through GISAXS modeling analysis with IsGISAXS software, experimental scattering data provide quantitative nanostructure information in and out of the plane of objects deposited on a substrate. By combining an AFM, GISAXS, and modeling of the scattering data, we quantitatively examined four types of block copolymer (BCP) thin films, polystyrene-block-poly(methyl methacrylate), polystyrene-block-poly(2vinylpyridine), and polystyrene-block-poly(4-vinylpyridine), and polystyrene-block-poly(ethylene oxide), in reciprocal space and real space. The GISAXS technique provides much insight into not only spatial ordering but also the orientations of mesophase-separated nanostructures on a substrate, the roughness replication, the thickness of a film and the faceting of microscale-dewetted terraces in the thin films.

贊助單位: 1.國立中央大學數學系 2.國立中央大學數學與理論物理中心

敬 請 公 告 ， 歡 迎 參 加