Nanoimprint lithography of active materials

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Scientific Background / Current Research

Materials often exhibit markedly different behaviour on the nanoscale, from changes in mechanical properties such as elastic modulus, to deviations in thermal properties and phobicity. As industry moves towards manufacturing and processing that involves nanoscale dimensions and components, it becomes increasingly important to understand - and ultimately control - the properties of relevant active materials at the nanoscale.

Project

The aim of this project will be to leverage knowledge about the nanoscale physics and stress-strain mechanics of organic materials, derived from experiment and simulation, and combined with large-area fabrication techniques such as nanoimprint lithography (NIL) and roll-to-roll imprint systems, develop innovative ways of patterning materials in order to create functional nanostructure. For example, one might seek to use controlled elastoplastic deformation to locally modify the properties of a conductive conjugated polymer, active organic material such as those used in organic light emitting diodes and field effect transistors (OLED/OFET), or even biomaterials.

Funding

The possibility exists to apply for a funded Masters project based on this work.

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More information / References