

Engineering Nanomaterial Patterns for Emerging Technologies

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Date: Friday 26th May 2023 at 15:00

Location: School of Physical Sciences, Marconi Building, N115

Abstract:

Nanomaterials have attracted attention due to their immense potential in emerging applications such as advanced optoelectronics and electrochemical devices, catalysis and sensing. With rapid progress in the system requirements, driven in part by Moore's law, demand for lower dimension and cost effectiveness has also increased. In this regard, polymer assisted nanopatterning of inorganic materials have received considerable attention due to the ease of patterning process that can produce well-ordered and large-area nanostructures. In this presentation, I will majorly talk about an inorganic nanopatterning method called Sequential infiltration synthesis (SIS), derived from atomic layer deposition (ALD). SIS involves a binary gas phase reactions to infiltrate inorganic materials inside polymers films and nanopatterned polymers such as block copolymers. I will talk about the insights that we gain using microscopy and spectroscopy methods into the SIS mechanism driving the growth process and the morphological evolution.