NANOFABRICATION SEMINAR: From Ultra-Thin Metal Films to Nanostructured Glass: A Nanofabrication Workflow

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October 21, 2026
12:00 to 13:00
Seminar Room

Structuring materials at the micro- and nanoscale can strongly modify their macroscopic properties. When characteristic dimensions become comparable to relevant physical length scales, optical, electrical, chemical and thermal responses can differ significantly from those of the corresponding bulk materials. Controlling matter at these scales therefore provides a powerful route to engineer functional surfaces and materials, but also requires fabrication processes capable of controlling dimensions, morphology and interfaces at the nanometre scale.

This seminar will focus on a nanofabrication route based on ultra-thin metal films (UTMFs) and their transformation into nanostructured glass surfaces. The process starts with the deposition of continuous metallic films only a few nanometres thick, where film nucleation, growth and the use of seed layers become particularly relevant. Rapid thermal processing (RTP) is then used to induce the dewetting of the films and form randomly distributed metallic nanoparticles, whose morphology can be tuned through the initial film and annealing conditions. Finally, these nanoparticles are used as self-assembled masks during reactive ion etching (RIE), transferring the nanoscale pattern into the underlying glass and producing surfaces covered by randomly distributed nanopillars.

The seminar will connect these three fabrication steps-UTMF deposition, thermal dewetting and dry etching-to show how relatively simple thin-film processing can be used to progressively engineer material morphology across different length scales. Particular attention will be given to the fabrication parameters and practical considerations that determine the transition from a bare substrate to a functional nanostructured surface.

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