Integrated Miniaturised Systems (IMS)
Nanoimprint-Lithography

Short Description:

Nanostructured surfaces attract much interest for optoelectronics, microfluidics, bioengineering and general electronics applications. We provide a complete process for replication of nanostructures in silicon and other materials such as metals, polymers and glass by means of thermal and UV-Nanoimprint lithography.

Nanoimprint lithography (NIL) is a convenient tool for the replication of nanostructures with many possible patterns. For example, by using repetitive, pillar-shaped structures, the widely studied lotus-effect gains part of its hydrophobic properties.

NIL works using either temperature or light together with force. Using e-beam lithography, a master stamp is produced containing the patterns, which is then pressed on a spun-on film of polymer on to a material of choice. By applying force and temperature (T-NIL) or force and light for curing (UV-NIL) the pattern is transferred to the polymer. Subsequent etching steps or additive processes allow the replicated pattern to be transferred into the desired material. FH KL is able to produce a wide variety of patterns (e.g. Fig. 1 and 2) with feature sizes from micrometers down to 20 nanometers with high aspect-ratios using NIL in polymer, glass, Si, SiO2, Ni and others.
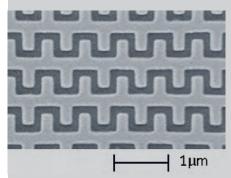

Figure 1: SEM Image of NIL-generated nanostructures with 100nm feature size.
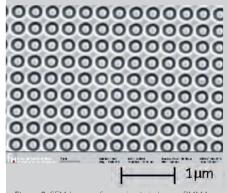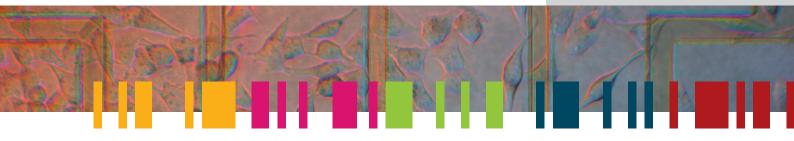

Figure 2: SEM Image of nanosized circles on PMMA substrate

Project duration:
Start: 01/01/2012
ongoing

Project management:
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