

Present and Future of Nanoimprint in Large-area Nanomanufacturing

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Of all nanopatterning technologies explored for large-area nanomanufacturing, nanoimprint clearly is one of the most promising ones, if not the most promising one. This is because nanoimprint, due to its fundamentally different working principle (i.e. mechanical pattern) from other nanopatterning methods, has demonstrated a unique combination of high-resolution (<1 nm), large-area (e.g. wall-paper size), high-throughput, and low cost, that is unmatched for large-area nanomanufacturing by other existing methods. Presently, compared with other nanofabrication methods, nanoimprint has perhaps the widest range of industrial applications, such as new materials, biotechnologies, displays, vital realities, subwavelength optical elements, solar cells, solid state lighting, fuel cells, data storage, optical communication, semiconductor ICs, to name a just a few. Nanoimprint is one of the most important manufacturing technologies in the 21st century.

The talk will present examples of nanoimprint in wide ranges of industrial applications (current status and future trend), will address a number of critical technology issues in large area nanoimprint, in particular, the large mold fabrication, and will present several innovative large area nanoimprint mold fabrication technologies developed by author's group.

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