

## CBIMMS Invited Seminar

# “Nanoimprinting Technique and its Applications”

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Friday, February 14, 2003

2:00 PM  
Building

203 Teer

### ABSTRACT

Our previous work on Si nanoelectronic devices and the requirement to mass fabricate other nanostructures has motivated us to develop a nanopatterning technique that is capable of ultrahigh resolution as well as very high throughput. This leads to the development of Nanoimprinting lithography, which now becomes an emerging technology that promises high resolution patterning, high throughput and low cost. Unlike soft contact printing that uses an elastomer stamp, nanoimprinting uses a hard mold to create nanoscale features by directly imprinting into the polymer film at an elevated temperature. Sub-10 nm resolution and large area patterning have been demonstrated in the past. I will present some recent development in the nanoimprinting technique, including a reversed imprinting process that enables "inking" of polymer materials onto a substrate; patterning on flexible substrate and on non-flat surfaces, as well as the creation of 3D polymer nanostructures. The nanoimprinting technique not only has the ability to pattern precise nanoscale features, but it is also compatible with polymer material processing. Based on these characteristics, we have applied nanoimprinting to several polymer based photonic devices. I will discuss the fabrication of photonic nanostructures in nonlinear optical polymers,

polymer waveguide based microring resonators, and high resolution pixels in polymer light emitting devices.