High Throughput Nanopatterning with Enabling Applications in Electronics, Energy and Biomedicine

Over the last two decades, nanoscience research has demonstrated the potential to greatly improve functionality in nano-scale devices and systems. Deployment of these advances at societal scales is however often non-trivial requiring revolutionary advances in volume nanomanufacturing that address scalability, reliability, metrology and cost constraints.

This talk will discuss high throughput nanomanufacturing processes that are built around inkjet based UV nanoimprint lithography. The research discussed here is driven by three themes (i) Creation of manufacturing building blocks - precision machines, materials, material delivery systems, templates, and metrology; (ii) Integration of building blocks via real-time and off-line algorithms to establish processes that meet nano-scale control, productivity and reliability metrics; and (iii) Optimization of these processes to create future generation nano-enabled devices and systems. Specific applications that will be discussed include CMOS memory, patterned media for hard disk drives, flexible nanoelectronics, shape/size controlled nanoparticles for diagnostics and drug delivery, and thin film photovoltaics.

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Dr. S.V. Sreenivasan specializes in the area of nano-manufacturing processes as applied to ultra-high density memory, mobile computing devices, and applications in biomedicine and clean energy. He is the Thornton Centennial Fellow in Engineering and professor of mechanical engineering at UT-Austin. He is also a co-founder of Molecular Imprints Inc., a company that commercializes nanolithography technology developed at the University of Texas at Austin. He received his Ph.D. in mechanical engineering from Ohio State University. Dr. Sreenivasan has published over 100 technical articles and holds over 100 U.S. patents in the area of nanomanufacturing. He has received several awards for his work including the Technology Pioneer Award from the World Economic Forum (2005), the ASME Leonardo da Vinci Award (2009), The 2010 O'Donnell Technology Innovation Award conferred by The Texas Academy of Medicine, Engineering and Science (TAMEST), and the ASME William T. Ennor Manufacturing Technology Award (2011).

