Fifty Years of Moore's Law:
Towards Fabrication at Molecular Dimensions

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Gordon Moore, a pioneer in the microelectronics industry, predicted that semiconductors would roughly double the number of transistors each year starting in 1965. For the last 50 years this has continued to be true leading to the smartphone, a "computer in your pocket" of today. In that period, critical dimensions in electronic devices have been reduced from micrometers to a few tens of nanometers. Lithography, the patterning process that has made Moore's Law possible now touches many areas of science ranging from electronics to biology and the life sciences. To continue on this remarkable path predicted in 1965 and to approach molecular scale pattern formation, new breakthroughs in patterning methods are needed. This talk will focus on new concepts, methods and materials, in particular efforts in directed self-assembly (DSA) and short wavelength extreme ultraviolet (EUV) lithography. DSA harnesses the phase behavior of block copolymers to create patterns defined by the microstructure of the polymer. In contrast, EUV patterning enables the production of arbitrary patterns at similar length scales. Photoresists based on oxide nanoparticles and a new patterning mechanism will be described.

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11:30 AM
Host: Mark Poliks

Refreshments served at 11:15 AM
ALL ARE INVITED