

MAR08-2007-007161

Abstract for an Invited Paper  
for the MAR08 Meeting of  
the American Physical Society

**Integration of block copolymers into lithographic processes<sup>1</sup>**

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In the photolithographic process, information in the form of exposed and unexposed material is transferred to a sacrificial photoresist film in the exposure tool. Through a series of processing steps patterned features are ultimately created from that information that can then define components of devices or other functional materials. As feature dimensions shrink below 30 nm, however, the fidelity of the transferred information using current resists may not meet manufacturing requirements, particularly with respect to control over the precise size and shape of the patterned features, and the cost of manufacturing at ever higher resolution may become prohibitively expensive. We are investigating techniques to integrate self-assembling block copolymers into the lithographic process for improved information transfer, process control, and sub 15 nm resolution. We demonstrate strategies to reach these objectives and at the same time retain essential lithographic process attributes such as pattern perfection, registration, the ability to pattern non-regular device-oriented structures, and high volume manufacturing.

<sup>1</sup>We gratefully acknowledge the NSF/UW NSEC and the Semiconductor Research Corporation for funding.