

Large-area Magnetic Nanostructure Arrays by Block Copolymer Nanolithography

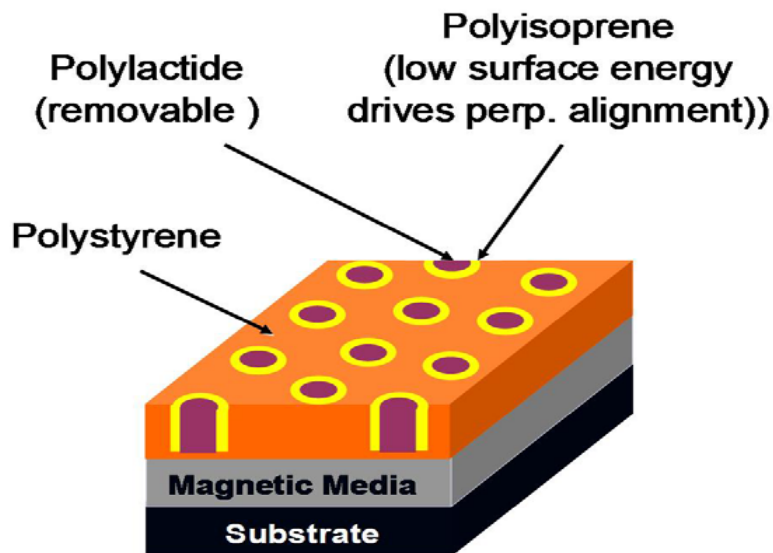
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NNIN Facilities utilized: Characterization Facility & Nanofabrication Center

- 3" area magnetic nanostructure arrays using cylinder-forming block copolymer templating:

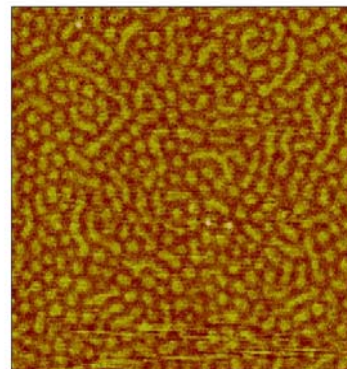
- ◆ Fundamental magnetism studies (including complex oxides)
- ◆ Potential applications as next generation recording media
- ◆ Feature sizes down to 12 nm



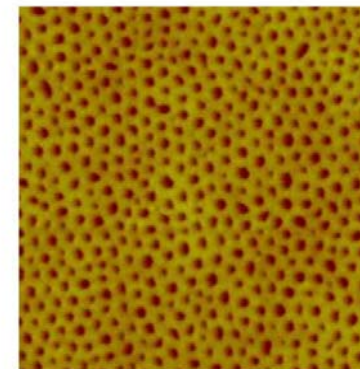
- Spontaneous cylinder alignment via surface energy engineering in triblock copolymers

- ◆ Low surface energy PI intermediate block
- ◆ Circumvents lengthy annealing processes

Diblock, as-spun



Triblock, as-spun



- Publications (2008)

- ◆ "Composite block polymer-microfabricated silicon nanoporous membrane", E. Nuxoll, M.A. Hillmyer, R.F. Wang, C. Leighton and R.A. Siegel, ACS Appl. Mat. and Int., in press (2009).
- ◆ "Spontaneous alignment of self-assembled ABC triblock terpolymers for large-area nanolithography", T. Kubo, R.F. Wang, D.A. Olson, M. Rodwogin, M. Hillmyer and C. Leighton, Appl. Phys. Lett. **93** 133112 (2008).