

Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Periodic Polymers for Technology EDWIN THOMAS, M.I.T. — *Periodic* polymeric materials comprised of solid polymer and air have interesting interactions with electromagnetic and mechanical waves giving rise to complex dispersion relations including zero density of states (band gaps). The key concern for photonic materials is dielectric contrast, whereas for phononic materials, it is density contrast and relative speed of longitudinal and transverse waves in the two media that is important. The creation of a material with a dual band gap, that is a complete band gap for light and a complete band gap for sound would allow strong coupling in localized defect regions. Progress in this area requires the ability to design and model targeted geometries and excellent control of structure fabrication. Top-down, and bottom-up approaches, involving interference lithography and self assembly respectively are demonstrating good success in fabricating the requisite structures and creating desired properties for photonics and phononics.

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Date submitted: 26 Nov 2007

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