

Mesoscale Priority Research Direction  
(Ultrasonically Guided Assembly of 3D Periodic Structures)

Opportunity

Taking nanoscopic building blocks and assembling them into functional entities, such as complex 3D periodic structures including multilevel interactions with emergent properties

Meso Challenge

Create and exploit materials with structural complexity that exhibit collective behavior with useful functionality.  
Understand how these collective phenomena emerge from the nanoscale and predict their behavior and functionality.  
Develop applications of their functionality.

References:

Approach

Develop controlled synthesis of complex 3D periodic composite structures using ultrasonic radiation force guided assembly.  
Develop techniques (high resolution imaging) for characterization of such complex systems  
Theoretical model for predicting behavior

Impact

Biomedical  
Sub-wavelength imaging - biological cells  
Unique sensors & devices  
Fundamental understanding will lead to rational design of new materials with tailored functionality



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# Ultrasonically Guided Assembly of 3D Periodic Structures

