

Department of Mechanical and Biomedical Engineering

Seminar Series

Architected Metamaterials for Guiding Energy Dissipation and Wave Propagation

Prof. Nicholas Xuanlai FANG

Associate Professor

Department of Mechanical Engineering,
Massachusetts Institute of Technology, USA

Date	September 1, 2017 (Friday)
Time	10:00am – 12:00noon
Venue	B6619 (MBE Conference Room), 6/F, Lift 4, AC1

Abstract

Three-dimensional lightweight material building blocks, through the combination of molecular design of material behavior and microscale geometric patterning, show promise to revolutionize the ability to dissipate energy and manipulate wave propagation. Such materials are desirable for a broad array of applications such as structural components, catalysts supports and energy efficient materials.

In this seminar, I will present our development of three dimensional micro/nanofabrication technique, projection microstereolithography (PuSL), to enable design and exploration of digitally coded multifunctional and multimaterial lightweight metastructures at unprecedented dimensions. The ultra-high resolution and multi-material capabilities of the 3D printing system and the modeling tools developed can be used to design and fabricate architected materials for combined functions, including energy absorption, thermal insulation, actuation/morphing, electrical conduction, cooling channels, and micro-scale heat exchangers. These structures show promise on focusing and rerouting acoustic waves through broadband and highly transparent metamaterials.

About the Speaker

Nicholas X. Fang received his BS and MS in physics from Nanjing University, and his PhD in mechanical engineering from University of California Los Angeles. He arrived at MIT in Jan 2011 as Associate Professor of Mechanical Engineering. Prior to MIT, he worked as an assistant professor at the University of Illinois Urbana-Champaign. Professor Fang's areas of research look at nanophotonics and nanofabrication. His recognitions include the ASME Chao and Trigger Young Manufacturing Engineer Award (2013); the ICO prize from the International Commission of Optics (2011); an invited participant of the Frontiers of Engineering Conference by National Academies in 2010; the NSF CAREER Award (2009) and MIT Technology Review Magazine's 35 Young Innovators Award (2008).

Enquiry: 3442 8420

All are Welcome!

MBE Seminar 2017-18/07