

Abstract:

Lattice materials with a periodic microstructure are suitable for multifunctional structural applications with high specific stiffness, favourable acoustic and thermal properties. Typical applications include sandwich beams, panels, space trusses and metamaterials. This seminar presents a unified structural mechanics perspective on mechanical response of lattice materials viewed as a periodic network of beams. Two distinct regimes of mechanical response are identified: in spatially extended response regime the entire lattice can sustain deformation; deformation can be confined to a spatially localised region due to defects, interfaces, and nonlinearity. A wide range of phenomena exhibited by finite and infinite lattices subjected to static and dynamic loads is considered from a unified structural mechanics perspective combining Bloch wave theory with Finite Element Method. Structural and Biomedical device applications will be highlighted.

Biography:

A. Srikantha Phani received the Ph.D. degree from University of Cambridge, Cambridge, U.K., in 2004. He is currently an Assistant Professor in the Department of Mechanical Engineering, The University of British Columbia, Vancouver, B.C., Canada. His research interests are in dynamics of lattice materials and devices; Nanomechanics. Dr. Phani is a Tier 2 Canada Research Chair in Dynamics of Lattice Materials and Devices. He is a Fellow of Cambridge Commonwealth Society.