ME Seminar

Topological Mechanics

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ABSTRACT

Due to the recent discovery of topological insulators in condensed matter physics, a new notion of topology has emerged in association with the intrinsic wave dispersion of structures. Such dispersion can be characterized by topological invariants, and the intrinsic robustness linked to the invariants manifests as a defect-immune vibration response of the structure. In this seminar, I will talk about our recent studies on 1D, 2D, and 3D structures showing unprecedented wave phenomena, and thus, potentially offering novel ways to manipulate mechanical waves robustly for applications in mechanical logic, energy harvesting, and vibration isolation.

ABOUT THE SPEAKER

Rajesh Chaunsali recently joined the Department of Aerospace Engineering at IISc as an Assistant Professor. Previously, he did his postdoctoral work at Laboratoire d'Acoustique de l'Université du Maine (LAUM) at CNRS, France. He earned his doctorate in 2018 from the University of Washington, Seattle, USA, in the Department of Aeronautics and Astronautics. He received his Bachelor's and Master's degrees in Mechanical Engineering from IIT Madras in 2012. He worked at General Electric Aviation from 2012 to 2014, where he designed composite fan blades for turbofan engines. Rajesh's research lies at the intersection of physics and engineering, where he is broadly interested in understanding and controlling the flow of mechanical energy in materials and structures. His recent work focuses on wave dynamics of nonlinear, disordered, active, and multistable systems.

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