**Session Title**: Energy Harvesting Applications of Metamaterials and Phononic Crystals

**Introduction**:

Metamaterials and phononic crystals, as artificially engineered structures, have revolutionized our way of manipulating wave propagation. These structures enable precise control over the propagation of sound, elastic, or electromagnetic waves, making them ideal for wave energy collection and conversion. Based on this, a wide variety of vibration suppression-energy harvesting bifunctional systems have been proposed, and this functional multiplexing design greatly improves the space utilization of the devices. Such systems are particularly promising for applications in low-power devices, self-powered sensors, and sustainable energy solutions in complex environments. In addition, unlike conventional approaches, metamaterials enable unique phenomena such as negative refraction for wave focusing, wave localization, defect modes, and topological interface modes, which significantly enhance wave energy conversion efficiency.

This special session is dedicated to exploring the latest breakthroughs and emerging trends in metamaterial-based energy harvesting. We aim to provide a platform for researchers across diverse disciplines to discuss novel design methodologies, experimental demonstrations, and real-world applications. By fostering interdisciplinary collaboration and inspiring innovative approaches, this session seeks to accelerate the development of next-generation energy harvesting technologies.

**Topics**:

* Novel energy harvesting mechanisms based on metamaterials and phononic crystals
* Design and fabrication of metamaterials and phononic crystals for energy harvesting applications
* Multifunctional Metamaterials for Simultaneous Sensing/vibration suppression/Energy Harvesting
* Reconfigurable and Adaptive Metamaterials for Dynamic Energy Harvesting Applications
* Nonlinear Dynamics in Energy Harvesting Metamaterials and Their Optimization
* Modeling and simulation of metamaterials and phononic crystals for energy harvesting
* Integration of Metamaterial-Based Energy Harvesters into Smart Systems and Wearable Devices
* Commercialization and industrialization of metamaterials and phononic crystals
* Machine Learning and AI-Assisted Design of Metamaterials for Energy Applications
* Challenges and opportunities in the development of metamaterials and phononic crystals

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