

Acoustic Metamaterials And Phononic Crystals Preamble

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Acoustic Metamaterials And Phononic Crystals

An acoustic metamaterial, sonic crystal, or phononic crystal, is a material designed to control, direct, and manipulate sound waves or phonons in gases, liquids, and solids (crystal lattices). Sound wave control is accomplished through manipulating parameters such as the bulk modulus β , density ρ , and chirality. They can be engineered to either transmit, or trap and amplify sound waves at ...

Acoustic metamaterial - Wikipedia

Phononic crystals are artificial periodic composite materials consisting of periodically distributed individuals (single acoustic functional scatter) in a matrix with high impedance contrast of mass densities and/or elastic moduli, which can give rise to new acoustic dispersions and band structures due to the periodic Bragg scattering as well as localized Mie scatterings from the individuals.

Phononic crystals and acoustic metamaterials - ScienceDirect

This comprehensive book presents all aspects of acoustic metamaterials and phononic crystals. The emphasis is on acoustic wave propagation phenomena at interfaces such as refraction, especially unusual refractive properties and negative refraction. A thorough discussion of the mechanisms leading to such refractive phenomena includes local ...

Acoustic Metamaterials and Phononic Crystals | SpringerLink

Phononic crystals and metamaterials have been used to attenuate and manipulate acoustic and elastic waves through band gaps, frequency bands where the waves cannot propagate [1] [2][3].

(PDF) Phononic Crystals and Acoustic Metamaterials

This comprehensive book presents all aspects of acoustic metamaterials and phononic crystals. The emphasis is on acoustic wave propagation phenomena at interfaces such as refraction, especially unusual refractive properties and negative refraction. A thorough discussion of the mechanisms leading to

Acoustic Metamaterials and Phononic Crystals | Pierre A ...

As a new kind of artificial material developed in recent decades, metamaterials exhibit novel performance and the promising application potentials in the field of practical engineering compared with the natural materials. Acoustic metamaterials and phononic crystals have some extraordinary physical properties, effective negative parameters, band gaps, negative refraction, etc., extending the ...

A Review of Acoustic Metamaterials and Phononic Crystals

Acoustic metamaterials and phononic crystals have some extraordinary physical properties, effective negative parameters, band gaps, negative refraction, etc., extending the acoustic properties of ...

(PDF) A Review of Acoustic Metamaterials and Phononic Crystals

Acoustic metamaterials and phononic crystals: Towards the total control of the wave propagation Abstract: Classical waves, including elastic waves (acoustic waves) and electromagnetic waves (optical waves and microwaves), are described by conventional wave-propagation functions.

Acoustic metamaterials and phononic crystals: Towards the ...

Acoustic Metamaterials (AMM) and Phononic Crystals (PC) have the potential to unfold a new wave of disruptive technologies to radically transform human interactions, sensory communications, and beyond.

Fabricating and Assembling Acoustic Metamaterials and ...

Introduction to Photonic and Phononic Crystals and Metamaterials, by Arthur R. McGurn, presents a study of the fundamental properties of optical and acoustic materials which have been of recent interest in nanoscience and device technology.

[PDF/eBook] Acoustic Metamaterials And Phononic Crystals ...

Unlike phononic crystals, which derive their unique properties from the mutual interaction of elements whose size and spacing are on the order of a wavelength, acoustic metamaterials rely on subwavelength structure—both in the geometry of the individual elements and in the spacing between them—and self-interaction to generate novel behaviors.

Acoustic metamaterials: Physics Today: Vol 69, No 6

3.3 Phononic Crystal ... acoustic metamaterial and the motivations of this dissertation, the other three chapters organized as following: The second chapter describes the approach to build an acoustic metamaterial based on the transmission line model.

ACOUSTIC METAMATERIAL DESIGN AND APPLICATIONS BY SHU ZHANG ...

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An acoustic metamaterial, sonic crystal, or phononic crystal, is a material designed to control, direct, and manipulate sound waves or phonons in gases, liquids, and solids (crystal lattices). Sound wave control is accomplished through manipulating parameters such as the bulk modulus β , density ρ , and chirality.

Acoustic Metamaterials And Phononic Crystals Preamble

The emphasis is on acoustic wave propagation phenomena at interfaces such as refraction, especially unusual refractive properties and negative refraction. A thorough discussion of the mechanisms leading to such refractive phenomena includes local resonances in metamaterials and scattering in phononic crystals.

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Acoustic metamaterials. Acoustic MMs, usually rely on a geometrical design to control sound wave propagation. The same ideas as for photonic MMs can often be applied, because of the similar behavior of the electromagnetic and acoustic waves. Phononic crystals, which are conceptually similar to photonic crystals, ...

Phononic Crystal - an overview | ScienceDirect Topics

This comprehensive book presents all aspects of acoustic metamaterials and phononic crystals. The emphasis is on acoustic wave propagation phenomena at interfaces such as refraction, especially unusual refractive properties and negative refraction. A thorough discussion of the mechanisms leading to...

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