Efficient nonreciprocal mode transitions in
Nov 04, 2021 · Here, we overcome these limitations in terms of speed, efficiency, sensitivity, and precision of spatiotemporal modulation in acoustic metamaterials (29–31) and experimentally demonstrate a range of nonreciprocal mode transitions and steering for airborne sound waves. Avoiding slowly moving mechanical components (32, 33), individually controlled piezoelectric elements in large ...

PHYSICS Copyright © 2021 Efficient nonreciprocal mode
in spatiotemporally modulated acoustic metamaterials Zhaoxian Chen1,2†, Yugui Peng3†, realizing programmable dynamic control of the acoustic impedance over a m is the modulating spatial wave vector, 0 is Z the static acoustic impedance, and Z n is the modulation strength of

Metamaterial - Wikipedia
Acoustic metamaterials control, direct and manipulate sound in the form of sonic, infrasonic or ultrasonic waves in gases, liquids and solids. As with electromagnetic waves, sonic waves can exhibit negative refraction. Control of sound waves is mostly accomplished through the bulk modulus β, mass density ρ and chirality. The bulk modulus and

Acoustic - Wikipedia
Acoustic location, a pre-radar and pre-sonar method of detecting hostile vehicles and vessels Acoustic metamaterials, engineered materials with atypical properties Acoustic signature, sound emitters, such as those of ships and submarines

Metamaterials - an overview | ScienceDirect Topics
Acoustic metamaterials offer a new paradigm for the control and manipulation of sound waves that are often unachievable through conventional materials. The potential this offers to the field of sound absorption, insulation, cloaking, and imaging are remarkable.

TGx:Acoustic Waves in Periodic Structures, Metamaterials
Nov 08, 2021 · The following chapters give a detailed consideration of acoustic wave propagation in viscothermal fluids and porous media, and the extension of this theory to non-local models for fluid saturated metamaterials, along with a description of the relevant numerical methods.

Explaining metamaterials and metasurfaces - properties and
Acoustic metamaterials. Akin to metamaterials that can be used to manipulate wave phenomena such as radar, sound and light, metamaterials are also able to control environmental sounds and structural vibrations, which have similar waveforms.
Transformation Metamaterials - Xu - Advanced Materials
Oct 07, 2021 · It provides a geometric recipe to control EM waves at will. A series of examples of achieving transformation media by artificially structured units from conventional materials is summarized here. Such concepts are firstly implemented for EM waves, and then extended to other wave dynamics, such as elastic waves, acoustic waves, surface water

Mechanical metamaterials based on origami and kirigami
Nov 23, 2021 · In this review, we categorize origami/kirigami-based mechanical metamaterials in three groups, as shown in Fig. 1. First, based on the folding or cutting of thin-film materials, mechanical metamaterials based on origami and/or kirigami are divided into three categories: (i) origami-based ones (with folding only), (ii) kirigami-based ones (with cutting only), and (iii) hybrid origami-kirigami

On the Determination of Acoustic Properties of Membrane
Nov 04, 2021 · The article focuses on the determination of the acoustic properties (sound transmission loss, sound absorption and transmission coefficient under acoustic plane wave excitation) of membrane-type of specimens by means of a combination of incident plane wave sound pressure and membrane surface displacement information, measuring the sound pressure with a microphone and the ...

Wireless power transfer based on novel physical concepts
Oct 22, 2021 · A non-uniform metasurface has also been proposed to control the wave propagation using the hybridization bandgap, which provides an effective ...

Acoustic non-Hermitian skin effect from twisted winding
Nov 02, 2021 · A photograph of two acoustic resonators (labeled by “1” and “2”) connected by two cross-linked narrow waveguides. The non-reciprocal coupling is implemented by an amplifier (equipped with

Ultrasonics - Journal - Elsevier
Ultrasound is the only internationally established journal which covers the entire spectrum of ultrasound research, technology and applications. Ultrasonics contains a variety of sections to keep its readers abreast of the state of the art in both fundamental investigation and real-world development related to ultrasonics. Ultrasonics publishes papers of exceptional quality and of relevance to

Faculty Profiles - Mechanical Engineering
Bogdan Popa Assistant Professor, Mechanical Engineering bipopa@umich.edu Research Interests: Design, optimization, and dynamics of new generations of engineered materials (metamaterials) that allow improved control over the propagation of acoustic, elastic and electromagnetic waves with applications in biomedical engineering, telecommunications

Solid Mechanics - Mechanical Engineering - Purdue University
Solid Mechanics. While textbooks define Solid Mechanics as the study of the motion, deformation, or fracture of solid materials to external and internal forces -- the breadth of this field is enormous.

American Society of Mechanical Engineers - Tracks and Topics
Description: Acoustics, Vibration, and Phononics - is organized by the Noise Control and Acoustics Division (NCAD) of the ASME. The Track contains a collection of Topics in the broad areas of acoustics, mechanical vibrations, and phononic metamaterials which are individually organized by leading researchers in the field.

All ECE Faculty | Electrical & Computer Engineering at
Research Interests: Design and fabrication of microsensors, microactuators, and micro-electro-mechanical systems (MEMS) for a variety of applications such as inertial sensing, environmental sensing, scanning microscopy, microfluidics, microoptics, and biomedical instrumentation; Development of manufacturing processes using combinations of traditional and novel materials and techniques, for

Journal of Physics D: Applied Physics - IOPscience
An international journal publishing high quality work concerned with all aspects of applied physics research, from biophysics, magnetism, plasmas, semiconductors, energy materials and devices to the structure and
properties of matter.

**Online Program | PIERS2021**

A Novel Semi-physical Simulation Platform for Train Braking System Based on Cascade Control Strategy. Ying Liu

**Temperature Sensing Characteristics of Surface Acoustic Wave Brillouin Scattering in Optical Microfibers**

*Yi Liu, Optically and Voltage Reconfigurable Metamaterials.

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**Physical Review Letters - Volume 127 Issue 15**


**Applied Physics Letters - AIP Publishing LLC**

3 hours ago · Acoustic and Elastic Metamaterials and Metasurfaces Submission Deadline: April 30, 2022. The paradigm of metamaterials, in which engineered structures are used to control wave propagation and transport, are applicable to a wide range of dynamical systems. First conceived for electromagnetics, the...

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Jul 19, 2014 · Researchers have proposed and constructed acoustic versions of invisibility shields and other structures: devices that seem invisible to sound waves as...

**Fellowship Snapshots 2021 | Duke Graduate School**

Nov 16, 2021 · Acoustic metamaterials, typically, are subwavelength devices that alter an impinging wave upon contact with its surface. This can be utilized in reducing the transmission of noise, biomedical ultrasound imaging, acoustic lenses, acoustic cloaking, and wave steering, just to name a few.

**Sensors | Special Issues - MDPI**

Special Issues. Sensors runs special issues to create collections of papers on specific topics. The aim is to build a community of authors and readers to discuss the latest research and develop new ideas and research directions.

**New Journal of Physics - IOPscience**

The Institute of Physics (IOP) is a leading scientific society promoting physics and bringing physicists together for the benefit of all. It has a worldwide membership of around 50 000 comprising physicists from all sectors, as well as those with an interest in physics.

**Civil Engineering News -- ScienceDaily**

Nov 27, 2021 · Civil Engineering News and Research. From new mathematical models for building better structures to new corrosion-resistant composites, read all the latest discoveries in civil engineering here.
Acoustic metamaterials and wave control
Acoustic metamaterials could be used in radio waves akin to metamaterials that can be used to manipulate wave phenomena such as radar, sound and light, metamaterials are also able to control.

Explaining metamaterials and metasurfaces - properties and applications
The results entitled “Broadband impedance modulation via non-local acoustic metamaterials” have been published in National Science Review on September 11th. In wave physics, one can rein the

Ultra-broadband sound absorber
The metamaterials permit engineers to control the wave propagation by arranging the Major Key Companies Involving in Metamaterials Market: Acoustic Metamaterials Group Ltd., Advanced Research.

Metamaterials market revenue share analysis, region & country forecast, 2021-2026
Her research project was titled Active flow control methods for aerodynamics and aeroacoustics computational methods for three-dimensional wave scattering and acoustic metamaterials. Yannick was a

Alumni and associates
Latest released, the research study on Global Acoustic Metamaterial Market Research Report 2021, report comprises growth rate, size, analysis by type, market segment by Application, market.

Acoustic metamaterial market global growth opportunities and market scenario and forecast 2021 - 2027
Binaural detection as a joint function of masker bandwidth, masker interaural correlation, and interaural time delay: Empirical data and modeling.

The Journal of the Acoustical Society of America
Opportunities arise from invisible hardware which works (together) autonomously, automatically adjusts settings or intuitively via voice control. The Internet of Examples are Bluetooth, NFC, Wi-Fi.

Internet of things explained - everything you need to know about the internet-of-things
He is the TPC chair of the 2008 IEEE Radio Wireless Symposium incorporating WAMICON, General Chair of the IASTED’s Antenna, Radar, and Wave Propagation Conference (ARP2008), Baltimore, MD, General.

Afshin Daryoush
Passive devices which have electrical dimensions comparable with the working wavelength, and which operate at frequencies up to but not including optical frequencies, e.g. microwave, and their

CPC definition - subclass h01p
Oct 18, 2021 (CDN Newswire via Comtex) -- This is the latest report titled Global Acoustic Metamaterial Market 2021 by Manufacturers, Regions, Type and Application, Forecast to 2027 recently.

Global acoustic metamaterial market trends analysis research report 2021 to 2027
Control systems; Development of a low cost collision avoidance Solid-state electronics research spans electromagnetic wave interactions with materials, micro- and nanoscale electronic materials.

Research focus
Design of the control system for the non-linear robotics problem. Classroom
studies are followed by hands-on applications in the Automated Manufacturing Assembly and Robotics Laboratory. Physical

course listing for mechanical engineering
The woofer cone even does double duty as a wave and acoustic instrumentation. With my eyes closed, the original cast recording of Lin-Manuel Miranda’s Hamilton really put me in “the room where it

kef ls50 wireless ii review: supersonic streaming speakers
The AC/DC Module sets the stage for the simulation and modeling the performance of resistors, capacitors, inductors, coils, motors, and sensors.

Although these devices are principally characterized by

linux computer-aided design and computer-aided manufacturing software (cad/cam)
Morrissey College programs span the humanities, natural sciences, and social sciences. The range of undergraduate and graduate offerings invites students to experience many approaches to the