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# Controlling sound with acoustic metamaterials

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1069	Non-reciprocal elastic wave propagation in spatiotemporal periodic structures. <b>2016</b> , 18, 083047		127
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1067	Holey-structured metamaterial lens for subwavelength resolution in ultrasonic characterization of metallic components. <b>2016</b> , 108, 224101		36
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1065	Reciprocity, passivity and causality in Willis materials. <b>2016</b> , 472, 20160604		36
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Negative-Index Acoustic Metamaterial Operating above 100 kHz in Water Using Microstructured Silicon Chips as Unit Cells. 2200407  A broadband low-frequency muffler based on neural network method and Helmholtz resonator with helical neck. 107754632211071  Inertial-Amplified Mechanical Resonators for the Mitigation of Ultralow-Frequency Vibrations. 2022  Inertial-Amplified Mechanical Resonators for the Mitigation of Ultralow-Frequency Vibrations. 2022  Satellite vibration isolation using periodic acoustic black hole structures with ultrawide bandgap. 1-12  Deeply subwavelength giant monopole elastodynamic metacluster resonators. 2022, 478,  Asymmetric Localization of Light by Second-Harmonic Generation. 2022, 18,  Passively and actively enhanced surface plasmon resonance sensing strategies towards single molecular detection.  Metamaterial shields for inner protection and outer tuning through a relaxed micromorphic approach. 2022, 380,  Woltage-controlled density-near-zero piezoelectric metamaterials for wavefront shaping, acoustic splitting, focusing and doping. 2022, 15, 074003  Woltage-controlled density-near-zero piezoelectric metamaterials for wavefront shaping, acoustic splitting, focusing and doping. 2022, 15, 074003  Broadband sound absorption using multiple hybrid resonances of acoustic metasurfaces. 2022, 229, 107508  Supersonic meta-plate with tunable-stiffness nonlinear oscillators for nonlinear flutter suppression. 2022, 229, 107533	188		1
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172	An effective method to enhance the underwater sound absorption performance by constructing a membrane-type acoustic metamaterial.	O
171	A Poisson scaling approach to backward wave propagation in a tube. <b>2022</b> , 380,	
170	Addition of Two Substantial Side-Branch Silencers to the Interference Silencer by Incorporating a Zero-Mass Metamaterial. <b>2022</b> , 15, 5140	
169	Machine Learning Non-reciprocity of a Linear Waveguide with a Local Nonlinear, Asymmetric Gate: Case of Weak Coupling. <b>2022</b> , 117211	1
168	Photo-responsive hydrogel-based re-programmable metamaterials. <b>2022</b> , 12,	1
167	A surrogate model-assisted robustness-oriented tolerance design method based on Reverse model[]2022, 33, 491-516	2
166	Perspective: Acoustic Metamaterials in Future Engineering. 2022,	0
165	Research on the low-frequency sound absorption characteristics of coiled Helmholtz cavity acoustic metamaterials. <b>2022</b> , 14, 168781322211199	
164	Ultra-Broadband Metamaterial Silencer with Outstanding Heat-Transferring Performance.	
163	Tuning and controlling antiplane shear wave propagation in elastic membranes. <b>2022</b> , 12, 085319	
162	Non-Hermitian Physics without Gain or Loss: The Skin Effect of Reflected Waves. <b>2022</b> , 129,	1
161	Sound-absorption performance of a coupled square-neck embedded Helmholtz resonator. <b>2022</b> , 61, 090902	
160	Topological acoustics.	2
159	Mode hybridization in DNA-inspired helical metamaterials with variable centro-asymmetry. <b>2022</b> , 121, 072201	
158	Acoustic metamaterial for highly efficient low-frequency impedance modulation by extensible design. <b>2022</b> , 56, 101855	1
157	Investigation and Analysis of Acoustojets by Spectral Element Method. <b>2022</b> , 10, 3145	1
156	Plate-type acoustic metamaterials with integrated Helmholtz resonators. <b>2022</b> , 199, 109019	O
155	Multifield nested metafilters for wave propagation control. <b>2022</b> , 56, 101885	O

154	Broadband low-frequency bidimensional honeycomb lattice metastructure based on the coupling of subwavelength resonators. <b>2022</b> , 199, 109038	1
153	The low frequency structure-borne sound problem in multi-storey timber buildings and potential of acoustic metamaterials: A review. <b>2022</b> , 224, 109531	1
152	Enhanced vibration suppression using diatomic acoustic metamaterial with negative stiffness mechanism. <b>2022</b> , 271, 114939	О
151	Investigation on tunable low-frequency property of magnetic field induced phononic crystal with Archimedean spiral-beams. <b>2023</b> , 185, 109756	Ο
150	Transformation Optics for Multiscale ElectromagneticThermal Multiphysics Simulation. 2022, 1-11	О
149	Barrier-free duct muffler for low-frequency sound absorption. 9,	O
148	Lightweight Liquid Metal-Elastomer Foam with Smart Multi-Function. 2205167	1
147	Multifunctional acoustic logic gates by valley sonic crystals. <b>2022</b> , 121, 123506	1
146	Steering of flexural wave propagation in tunable magnetorheological elastomers metasurface by modulating magnetic field. <b>2022</b> , 107793	О
145	Acoustic impurity shielding induced by a pair of metasurfaces respecting PT symmetry. <b>2022</b> , 106,	О
144	Sandwich meta-panel based on grooved corrugation for low-frequency sound absorption. <b>2022</b> , 139, 60004	О
143	Topological Lifshitz transition in twisted hyperbolic acoustic metasurfaces. <b>2022</b> , 121, 122201	О
142	Deep learning-assisted multifunctional wavefront modulation with Willis coupling. 2022, 121, 113501	О
141	Modelling and Simulation of Acoustic Metamaterials for Architectural Application. 2023, 223-236	О
140	Topological sound in two dimensions.	О
139	Instabilities of intrinsic thermoacoustic modes in a thermoacoustic waveguide with anechoic terminations. <b>2022</b> , 106,	Ο
138	A unified framework for linear thermo-visco-elastic wave propagation including the effects of stress-relaxation. <b>2022</b> , 478,	1
137	Acoustic metamaterials driven transdermal drug delivery for rapid and on-demand management of acute disease.	O

136	Acoustic computing: At tunable pseudospin-1 Hermitian Dirac-like cone. <b>2022</b> , 152, 1449-1462	0
135	Maximum electro-momentum coupling in piezoelectric metamaterial scatterers. <b>2022</b> , 132, 125108	О
134	Low frequency passive vibration isolation technology and its application prospect in ship equipment. <b>2022</b> ,	О
133	A wave-confining metasphere beamforming acoustic sensor for superior human-machine voice interaction. <b>2022</b> , 8,	o
132	Band degeneration and evolution in nonlinear triatomic metamaterials.	O
131	Study of Low-Frequency Sound Absorption Based on Negative Stiffness Membrane Structure. <b>2022</b> , 14, 1858	O
130	Recent advances in acoustofluidic separation technology in biology. <b>2022</b> , 8,	2
129	Theory for 'Coupled Thermoelectric Metamaterials: Bilayer Scheme. <b>2023</b> , 87-101	O
128	Design and performance evaluation of steel beam members with plate-type locally resonant metamaterials for vibration control.	О
127	Homogeneous Dislocation-Induced Rainbow Concentrating for Elastic Waves. 2022, 18,	O
126	Acoustic metamaterials with controllable bandgap gates based on magnetorheological elastomers. <b>2022</b> , 107829	0
125	Scattering properties of acoustic beams off spinning objects: Induced radiation force and torque. <b>2022</b> , 121, 141702	O
124	Lightweight meta-lattice sandwich panels for remarkable vibration mitigation: Analytical prediction, numerical analysis and experimental validations. <b>2022</b> , 163, 107218	О
123	Correlating multimode strain and electrode configurations for high-performance gradient-index phononic crystal-based piezoelectric energy harvesting.	O
122	Topological phononics arising from fluid-solid interactions. <b>2022</b> , 13,	О
121	Origami-based acoustic metamaterial for tunable and broadband sound attenuation. 2022, 107872	1
120	Realization of the Quantum Spin Hall Effect Using Tunable Acoustic Metamaterials. 2022, 18,	0
119	Design concept verification for a transcranial acoustic lens with instantaneous adaptability. <b>2022</b> , 132, 144504	O

118	Negative refraction and mode trapping of flexuralEorsional waves in elastic lattices. 2022, 380,	1
117	Scalable 3D printing for topological mechanical metamaterials. <b>2022</b> , 101911	О
116	Wave beaming and diffraction in quasicrystalline elastic metamaterial plates. 2022, 4,	О
115	Scaling Theory of Wave Confinement in Classical and Quantum Periodic Systems. 2022, 129,	Ο
114	Coupled acoustic resonance for wave control and sensing. 10,	O
113	Broadband low-frequency sound absorption in open tunnels with deep sub-wavelength Mie resonators. 10,	O
112	Far-field ultrasonic imaging using hyperlenses. <b>2022</b> , 12,	0
111	Concentrated subradiant modes in a one-dimensional atomic array coupled with chiral waveguides. <b>2022</b> , 106,	O
110	A metastructure conceptual model of cantilever beam for transverse vibration attenuation. 1077546322113	3340
109	Mechanism of Low Frequency Spectral Scattering by a Side-Branch Electromagnetic Device with Switching Shunt. <b>2022</b> , 117423	O
108	t-METASET: Task-Aware Acquisition of Metamaterial Datasets Through Diversity-Based Active Learning. <b>2023</b> , 145,	1
107	Shaping contactless radiation forces through anomalous acoustic scattering. 2022, 13,	O
106	On band gap and damping of metamaterials involving negative-stiffness elements. 2022, 107877	0
105	A self-powered acoustic sensor excited by ultrasonic wave for detecting and locating underwater ultrasonic sources. <b>2022</b> , 104, 107879	O
104	Buckling induced negative stiffness mechanical metamaterial for bandgap tuning. 2023, 304, 116421	O
103	Anomalous mode-converting reflection of elastic waves using strip-type metagratings. 2023, 186, 109867	О
102	An active metamaterial cell concept for nonreciprocal vibroacoustic transmission. 2023, 186, 109829	0
101	Vectorial metasurface holography. <b>2022</b> , 9, 011311	4

100	Review of foundational concepts and emerging directions in metamaterial research: design, phenomena, and applications.	0
99	E-shaped split ring resonator used for metasurface- based metasurface-based structure with an ultra-high Q-factor for terahertz application. <b>2023</b> , 529, 129041	O
98	Phase space analysis of nonlinear wave propagation in a bistable mechanical metamaterial with a defect. <b>2022</b> , 106,	0
97	Impulse mitigation in nonlinear composite-based woodpile phononic crystals. <b>2022</b> , 121, 201706	O
96	Sound reflection by periodic acoustic metasurface in sheared grazing flows. <b>2022</b> , 107895	0
95	Nonlinearity enabled higher-order exceptional singularities with ultra-enhanced signal-to-noise ratio.	O
94	A novel design scheme for acoustic cloaking of complex shape based on region partitioning and multi-origin coordinate transformation. <b>2022</b> , 43, 1641-1656	О
93	Anisotropic Metallic Microlattice Structures for Underwater Operations.	O
92	Anomalous wavefront control via nonlinear acoustic metasurface through second-harmonic tailoring and demultiplexing. <b>2022</b> , 121, 201703	0
91	Planar focusing lens for enhanced far-field ultrasonic imaging. <b>2022</b> , 152, 2711-2719	O
90	Metahouse: Noise-Insulating Chamber Based on Periodic Structures. 2200711	1
89	Investigating Imbert-Fedorov shift at a planner interface of dispersive dissipative dielectric-magnetic metamaterial. <b>2022</b> , 170222	O
88	Deep learning-based prediction and interpretability of physical phenomena for metaporous materials. <b>2023</b> , 30, 100946	0
87	Ultra-wide low-frequency bandgap design of acoustic metamaterial via multi-material topology optimization. <b>2023</b> , 306, 116584	O
86	Etching metasurfaces on bluff bodies for vortex-induced vibration energy harvesting. 2023, 242, 108016	1
85	Temperature-controlled elastic wave transport in topological ferroelectric phononic crystal plates. <b>2023</b> , 241, 107964	O
84	Noise Attenuation Through Optimised Acoustic Metamaterials: A Low Form Factor Design for Targeted Noise Reduction. <b>2022</b> ,	О
83	Elastic Metasurface made of elliptic shape pillars for acoustic wave focusing. 2022,	1

82	A deep learning-based multi-fidelity optimization method for the design of acoustic metasurface.	О
81	Editorial: Advances in phononic and acoustic metamaterials. 10,	O
80	Comment on Mahariq et al. Investigation and Analysis of Acoustojets by Spectral Element Method. Mathematics 2022, 10, 3145. <b>2022</b> , 10, 4502	О
79	Artificial double-zero-index materials.	O
78	Customizable Acoustic Metamaterial Barrier with Intelligent Sound Insulation. 2022, 18,	О
77	Broadband Acoustic Metaveils for Configurable Camouflage. <b>2022</b> , 18,	O
76	Bio-Inspired Nanomembranes as Building Blocks for Nanophotonics, Plasmonics and Metamaterials. <b>2022</b> , 7, 222	О
75	Homogenization of sound-soft and high-contrast acoustic´metamaterials in subcritical regimes.	О
74	Converged wireless infrastructure with acoustic holographic array. <b>2022</b> , 9, 041413	O
73	Mode conversion of Lamb waves in a composite phononic crystal plate: Numerical analysis and experimental validation. <b>2022</b> , 132, 225103	О
72	Array scattering resonance in the context of Foldy approximation. 2022, 478,	O
71	Imaging Cloaked Objects: Diffraction Tomography of Realistic Invisibility Devices. 2200237	О
70	Birefringence of Single Polarization for Flexural-Wave Metamaterials. 2022, 18,	О
69	Observation of multiple rotons and multidirectional roton-like dispersion relations in acoustic metamaterials. <b>2022</b> , 24, 123019	O
68	Experimental demonstration of broadband reconfigurable mechanical nonreciprocity. 107754632211460	О
67	Dielectric Mie voids: confining light in air. <b>2023</b> , 12,	3
66	Parametrically excited unidirectional wave propagation in thin beam phononics. 2022, 49, 137-155	О
65	Noise Cancellation of a Train Electric Traction System Fan Based on a Fractional-Order Variable-Step-Size Active Noise Control Algorithm. <b>2022</b> , 1-10	О

64	A lightweight metastructure for simultaneous low-frequency broadband sound absorption and vibration isolation. <b>2023</b> , 153, 96-104	O
63	Resonance expansion of quadratic quantities with regularized quasinormal modes.	Ο
62	Superscattering of Underwater Sound via Deep Learning Approach. 2023, 40, 014301	Ο
61	Enhancing the Mechanical Properties of Auxetic Metamaterials by Incorporating Nonrectangular Cross Sections into Their Component Rods: A Finite Element Analysis. 2200194	O
60	Acoustic characterization of nanofibers for optimization with porous substrate. 2023, 153, 40-49	О
59	Effective medium theory for the low-temperature heat capacity of a metasolid plate. 2023, 4,	O
58	Total acoustic transmission in a honeycomb network empowered by compact acoustic isolator. <b>2023</b> , 13,	0
57	Phononic crystals Dand gap manipulation via displacement modes. 2023, 361, 115061	O
56	Acoustic transmission characteristics based on coiled-up space metamaterials. 2023, 203, 109199	0
55	Topological mechanics beyond wave dynamics. <b>2023,</b> 173, 105197	O
54	Tunable thermal expansion and bandgap properties of the bi-material-directional honeycomb metamaterial. 1-15	0
53	Environmental Noise Measurement Technique and Evaluation of Contribution of a Large Industrial Enterprise to Noise Pollution in the Neighboring Residential Area. <b>2022</b> , 59-65	O
52	3D Printing of Liquid Metals: Recent Advancements and Challenges. 2213312	0
51	Nonlocal cable-network metamaterials. 2209988	O
50	Emerging topics in nanophononics and elastic, acoustic, and mechanical metamaterials: an overview. <b>2023</b> ,	1
49	Analysis of an Adaptive Periodic Low-Frequency Wave Filter Featuring Magnetorheological Elastomers. <b>2023</b> , 15, 735	1
48	Neuroinnovation in Medicine: History and Future. <b>2023</b> , 13-55	0
47	Deep learning for the design of phononic crystals and elastic metamaterials. 2023, 10, 602-614	O

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46	Low-frequency sound-absorbing metasurface constructed by a membrane-covered and coiled Helmholtz resonator. <b>2023</b> , 133, 075106	О
45	On-demand contactless programming of nonlinear elastic moduli in hard magnetic soft beam based broadband active lattice materials. <b>2023</b> , 32, 055021	O
44	Peripheral focused ultrasound stimulation and its applications: From therapeutics to humanEomputer interaction. 17,	О
43	The mechanics and optimal design of micro-architectured stepped hexagonal lattices. <b>2023</b> , 313, 116900	О
42	Chiral-based mechanical metamaterial with tunable normal-strain shear coupling effect. <b>2023</b> , 284, 115952	O
41	Observation of an exceptional point with an LR-shunted resonator. <b>2023</b> , 196, 110297	O
40	Meta-ring for enhancing emission efficiency of omnidirectional SH waves. <b>2023</b> , 251, 108354	0
39	Broadband low-frequency sound absorption of honeycomb sandwich panels with rough embedded necks. <b>2023</b> , 196, 110311	O
38	Identifying elastic wave polarization and bandgaps in periodic solid media. 2023, 252, 108363	О
37	Reconfigurable metatiles with circular maze-like space-coiling-based acoustic metastructure for low-to-mid frequency sound attenuation. <b>2023</b> , 133, 154901	O
36	Absorption-lasing effects and exceptional points in parity-time symmetric non-Hermitian metaplates. <b>2023</b> , 555, 117710	0
35	Tunable ferroelectric auxetic metamaterials for guiding elastic waves in three-dimensions. <b>2023</b> , 59, 101966	O
34	Compact acoustic amplifiers based on non-adiabatic compression of sound in metamaterial waveguides. <b>2023</b> , 204, 109246	О
33	Damage detection, quantification, and localization for resonant metamaterials using physics-based and data-driven methods. 147592172311524	O
32	Single-phase continuum soft elastic metamaterial design based on variable boundary conditions through topology optimization. <b>2023</b> , 133, 055108	0
31	Simple acoustic metagrating for perfect two- and three-beam splitting. 10,	O
30	Complete acoustic bandgaps in a three-dimensional phononic metamaterial with simple cubic arrangement. <b>2023</b> , 133, 065101	0
29	Ultrathin Acoustic Holography. <b>2023</b> , 10, 2300034	O

28	Fate of the reentrant localization phenomenon in the one-dimensional dimerized quasiperiodic chain with long-range hopping. <b>2023</b> , 107,	O
27	Programmable Inverse-Designed Acoustic Coding Metasurfaces for Multifunctional Broadband Reflection.	O
26	Various topological phases and their abnormal effects of topological acoustic metamaterials. <b>2023</b> , 2, 179-230	0
25	Multi-element Metamaterial Design Through the Relaxed Micromorphic Model. 2023, 579-600	O
24	Acoustic metamaterials-driven transdermal drug delivery for rapid and on-demand management of acute disease. <b>2023</b> , 14,	O
23	Electroelastic metasurface with resonant piezoelectric shunts for tunable wavefront control. <b>2023</b> , 56, 164001	O
22	Design, material, function, and fabrication of metamaterials. <b>2023</b> , 11, 020401	0
21	Ultrabroadband and Reconfigurable Transmissive Acoustic Metascreen. 2300752	O
20	Modeling a labyrinthine acoustic metamaterial through an inertia-augmented relaxed micromorphic approach. 108128652211372	1
19	Tunable, reconfigurable, and programmable acoustic metasurfaces: A review. 10,	O
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