Qian Wu

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Education

PH.D in Mechanical Engineering, University of Missouri, Columbia, USA (2017-2022)
MSC in Condensed Matter Physics, Tongji University, China (2012-2015)
BENG in Mechatronics (Minor in Physics), East China Jiao Tong University, China (2008-2012)

Areas of interest

Wave Dynamics; Active/Passive Phononic Lattices; Phononic Topological Phase; Non-Hermitian Elastic Systems.

Employments

Postdoctoral Fellow, University of Missouri, Columbia, (2022-present)
Graduate Research Assistant, University of Missouri, Columbia, (2017–2022)
Graduate Teaching Assistant, University of Missouri, Columbia (2021–2022)
Research/Teaching Assistant, University of Missouri, Rolla (2016–2017)
Lab Engineer, Shanghai Jiao Tong University (2015–2016)
Research/Teaching Assistant, Tongji University (2012–2015)
Lab Engineer Intern, Shanghai Jiao Tong University (Jun. 2010–Aug. 2010)

Technical skills

Numerical: MATLAB; COMSOL Multiphysics (Solid Mechanics, Electromagnetics, Optics, and PDE/ODE modules); CST Microwave studio;.

Modeling: AutoCAD; Solidworks.
Experimental: 3D Polytec Laser Vibrometer (PSV-400); Formlab 3D printer; Vector Network Analyzer (VNA/PNA).

Publications & Conferences

Journal articles (*Equal contribution; †Corresponding author(s))

1. Q. Wu, S. Wang, G. Huang†, "Topological mode control in non-Hermitian elastic lattices". To be submitted.

2. Z. Jiang, L. Gao, Y. Chen†, Y. Fang, X. Wu, Y. Ding†, Q. Wu, Y. Sun, "Bistable switch based on tunable Fano resonance in coupled resonator-cavity structure". ***Journal of Applied Physics***. Under review.

3. Y. Ling, G. Zhao, Y. Su, Q. Wu, Y. Xu, Z. Chen, B. Arends, O. Emeje, G. Huang, J. Xie, Z. Yan†, "Multifunctional Mesh Bioelectronics with Skin-Like Nonlinear Mechanics for Concurrent Monitoring of Cardiac Electrical and Mechanical Functions". Under review.

4. Q. Wu, H. Qian, Y. Chen†, G. Huang†, "Dynamic phononic crystals with spatially and temporally modulated circuit networks". ***Acta Mechanica Sinica***. (Special issue: Elastic Metamaterials) Minor revision.

5. S. Lyu, Z. Wu†, X. Shi, Q. Wu, "Optical Fiber Biosensors for Protein Detection: A Review". ***Photonics***, Vol. 9(12), 987 (2022).

6. S. Wang*, Z. Hu*, Q. Wu*, H. Chen, E. Prodan†, R. Zhu†, G. Huang†, "Physical rendering of topological wave transport on elastic surfaces with synthetic dimensions". To be submitted.

7. W. Zhou, S. Wang, Q. Wu, X. Xu, X. Huang, G. Huang†, Y. Liu†, Z. Fan†, "An inverse design paradigm of multi-functional elastic metasurface via data-driven machine learning". ***Materials*** & ***Design***, Vol. 226, 111560 (2023).

8. Q. Wu, X. Xu, S. Wang, R. Zhu, Z. Yan, H. Ma, Y. Chen†, G. Huang†, "Odd mass density". ***Proceedings of the National Academy of Science (PNAS)***. Under second review.

9. Q. Wu, P. Shivashankar, X. Xu, Y. Chen, G. Huang†, "Dispersion engineering and non-reciprocity in a nonlocal micropolar metabeam". ***Journal of Composite Materials***. doi.org/10.1177/00219983221140562 (Special issue: Multifunctional composites for autonomic, adaptive and self-sustaining systems) (2022) .

10. Q. Wu*, X. Zhang*, P. Shivashankar, Y. Chen†, G. Huang†, "Independent flexural wave frequency conversion by a linear active metalayer". ***Physical Review Letters***, Vol. 128, 244301 (2022).

11. S. Yang, Y. Ling, Q. Wu, H. Zhang, Z. Yan, G. Huang, J. Lin, C. Wan†, "Lignin-derived Porous Graphene for Wearable and Ultrasensitive Strain Sensors". ***Journal of Materials Chemistry C***, (2022).

12. Q. Wu, G. Huang†, "Omnidirectional wave polarization manipulation in isotropic polar solids". ***International Journal of Solids and Structures***, Vol. 241, 111481 (2022).

13. X. Xu, Q. Wu, Y. Pang, Y. Cao, Y. Fang, G. Huang†, C. Cao†, "Multifunctional metamaterials enabled by triboelectric nanogenerators for energy harvesting and vibration reduction". ***Advanced Functional Materials***, 2107896 (2021).

14. H. Chen, H. Zhang, Q. Wu, Y. Huang, H. Nguyen, E. Prodan†, X. Zhou†, G. Huang†, "Creating synthetic spaces for higher-order topological sound transport". ***Nature Communications***, Vol. 12, 1-10 (2021).

15. H. Nguyen*, Q. Wu*, J. Chen, Y. Yu, H. Chen, S. Tracy, G. Huang†, "A broadband acoustic panel based on double-layer membrane-type metamaterials". ***Applied Physics Letters***, Vol. 118, 184101 (2021).

16. H. Nguyen*, Q. Wu*, H. Chen, J. Chen, Y. Yu, S. Tracy, G. Huang†, "A Fano-based acoustic metamaterial for ultra-broadband sound barriers". ***Proceedings of the Royal Society A***, Vol. 477, 20210024 (2021).

17. Q. Wu, H. Chen, H. Nassar, G. Huang†, "Non-reciprocal Rayleigh wave propagation in space–time modulated surface". ***Journal of the Mechanics and Physics of Solids***, Vol. 146, 104196 (2021).

18. X. Xu*, Q. Wu*, H. Chen*, H. Nassar, Y. Chen, A. Norris, M. Haberman, G. Huang†, "Physical observation of a robust acoustic pumping in waveguides with dynamic boundary". ***Physical Review Letters***, Vol. 125, 253901 (2020). (Highlighted as *Editor's Suggestion*)

19. H. Nguyen*, Q. Wu*, X. Xu, H. Chen, S. Tracy, G. Huang†, "Broadband acoustic silencer with ventilation based on slit-type Helmholtz resonators". ***Applied Physics Letters***, Vol. 117, 134103 (2020).

20. Q. Wu, H. Chen, X. Li, G. Huang†, "In-plane second-order topologically protected states in elastic Kagome lattices". ***Physical Review Applied***, Vol. 14, 014084 (2020).

21. Q. Wu, Y. Chen, G. Huang†, "Asymmetric scattering of flexural waves in a parity-time symmetric metamaterial beam". ***The Journal of the Acoustical Society of America***, Vol. 146, 850-862 (2019).

22. Q. Wu, Y. Li†, Y. Chen, Y. Sun, K. Fang, Y. Zhang, H. Chen, Z. Chen, "Enhanced wireless power transfer using magnetostatic volume modes in anisotropic magnetic metamaterials". ***2018 IEEE International Conference on Industrial Electronics for Sustainable Energy Systems (IESES)***, 17733286 (2018).

23. Q. Wu, Y. Li†, N. Gao, Y. Fan, Y. Chen, K. Fang, Y. Zhang, H. Chen, "Wireless power transfer based on magnetic metamaterials consisting of assembled ultra-subwavelength meta-atoms". ***EPL***, Vol. 109, 68005 (2015). (Highlighted by *Phys.org*)

24. Y. Chen, Y. Li†, Q. Wu, H. Jiang, Y. Zhang, H. Chen, "Quantum well effect based on hybridization bandgap in deep sub-wavelength coupled meta-atoms". ***Physica B***, Vol. 472, 1-5 (2015).

25. Y. Chen, Y. Li†, Q. Wu, H. Jiang, Y. Zhang, H. Chen, "Tuning the hybridization bandgap by meta-molecules with in-unit interaction". ***Journal of Applied Physics***, Vol. 118, 094505 (2015).

Conference articles

1. Q. Wu, G. Huang, "A Micropolar Metabeam With Nonlocal Feedback Control Circuits (Conference Presentation)". ***ASME 2021 International Mechanical Engineering Congress and Exposition (IMECE2021)***, IMECE2021-70609, V001T01A015, November 2021.

Conferences

1. Q. Wu, G. Huang, "Engineering wave nonreciprocity in a nonlocal metabeam (Oral Presentation)". ***SPIE Smart Structures + Nondestructive Evaluation***, March 2023.

2. Q. Wu, "Odd Mass Density (Poster Presentation)". ***Gordon Research Conference (GRC) 2022 Multifunctional Materials and Structures***, September 2022.

3. Q. Wu, G. Huang, "Nonreciprocal Elastic Wave Propagation Through a Non-Local Piezoelectric Metabeam (Oral Presentation)". ***ASME 2021 International Mechanical Engineering Congress and Exposition (IMECE2021)***, November 2021.

4. Q. Wu, Y. Chen, G. Huang, "Unconventional scattering of flexural waves in a tunable parity-time symmetric shunted piezoelectric beam (Oral Presentation)". ***Health Monitoring of Structural and Biological Systems XIV (International Society for Optics and Photonics)***, 113811I, 2020.

5. Q. Wu, G. Huang, "Nonreciprocal scattering of flexural waves in a tunable PT-symmetric shunted piezoelectric beam (Oral Presentation)". ***AmeriMech Symposium***, Columbia, Missouri, 2019.

6. Q. Wu, Y. H. Li, "Wireless power transfer based on magnetic metamaterials (Oral Presentation)". ***International Conference for Wireless Power Transfer Technique***, Nanjing, Jiangsu, 2014.

Honors

1. Outstanding Mechanical and Aerospace Engineering Ph.D. Student Award, College of Engineering, University of Missouri, 2022

2. National scholarship award for graduate student (3rd grade), 2015
3. National scholarship award for undergraduate student (3rd grade), 2009