

PROCEEDINGS**Bistable and multistable metamaterials: A comprehensive review and assessment****Zhen-Pei Wang^{1*} and David William Rosen^{1,2}**

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ABSTRACT

Bistable and multistable metamaterials have attracted increasing attention in the fields of materials science and engineering due to their unique properties of transitioning between different stable states. These properties allow for advanced functionalities such as programmable shape transformation, tunable mechanical properties, and adaptive responses to external stimuli. Recent research efforts have resulted in extensive exploration and development of these metamaterials.

Understanding their concepts, phenomena, engineering models, materials, and design complexities is crucial for fully harnessing their potential and realizing transformative applications in areas such as actuators, adaptive structures, sensing devices, and soft robotic systems. To this end, we review the latest progress and developments in bistable and multistable metamaterials, with a focus on evaluating engineering analysis models and design complexities, as well as the associated fabrication challenges.

This comprehensive review and assessment aim to provide a roadmap for addressing existing challenges and unlocking new opportunities in this rapidly evolving field. By synthesizing the current state of research and identifying areas for improvement, this work seeks to catalyze advancements in the utilization of bistable and multistable metamaterials for innovative technological applications.

KEYWORDS

Bistable structures; Multistable structures; Metamaterials

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