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ACTIVE PROGRAMMABILITY AND ARTIFICIAL INTELLIGENCE IN MECHANICAL METAMATERIALS

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ABSTRACT

Mechanical metamaterials are engineered materials with unconventional mechanical behavior that originate from artificially programmed microstructures along with intrinsic material properties. One of the rapidly emerging trends in this field is to couple the mechanics of material behavior and metamaterial architecture with different other multi-physical aspects such as electrical or magnetic fields, and stimuli like pneumatic pressure, temperature, light or chemical reactions to explore the scope of programming on-demand mechanical responses [1, 2]. This mini-symposium aims to concentrate on such active programmability in metamaterials along with physical and artificial intelligence across the length scales (including nano-scale metamaterials). The interest in this context would include (but not limited to) the evolving trends and challenges concerning the notions of real-time reconfigurability and functionality programming, nano-scale metamaterials, artificial intelligence and machine learning in metamaterials, inverse design and topology optimization, multi-physical origami/kirigami, soft and conformal metamaterials, intuitive understanding in metamaterial design, and computational additive manufacturing.

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