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MODELING AND INVERSE DESIGN OF ARCHITECTED MATERIALS

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Architected materials, whose mechanical properties are dictated not only by their composition but also by their spatial architecture, have been increasingly adopted in engineering applications. By carefully designing their microstructures, researchers have created materials with unique and tunable properties, such as programmable linear and nonlinear elastic responses, wave guidance and attenuation, reconfigurability, and enhanced fracture toughness. This minisymposium aims at bringing together researchers working on the forefront of modeling and inverse design of such materials, as well as their connection to specific applications. Topics of interest include, but are not limited to:

• Computational methods for modeling of periodic or non-periodic microlattices, woven materials, reconfigurable materials, bioinspired and cellular materials
• Homogenization and multiscale modeling of architected materials
• Inversely designed static and dynamic responses of architected materials, caused by external effects including waves and impact
• Model-based and data-based inverse design of materials for structural, mechanical and soft robotics applications
• Multi-physics modeling of architected materials with, for example, electro- or magneto-mechanical coupling
• Computational methods for damage and failure of architected materials