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SIMULATION AND MODELING OF ADDITIVELY MANUFACTURED FUNCTIONAL MATERIALS AND STRUCTURES

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ABSTRACT

Additive manufacturing (AM) offers new opportunities for creating functional materials and structures with tailored properties and complex geometries. Advances in multimaterial fabrication and 3D/4D printing enable the integration of diverse functionalities into components, expanding their potential across engineering applications. Computational modeling plays an essential role in understanding their behavior and guiding their design and manufacturing.

This invited session focuses on simulation and modeling approaches for additively manufactured functional materials and structures, including multimaterial systems, smart materials, and architected structures. Contributions addressing manufacturing processes, material behavior, and functional performance are welcome, using physics-based models, data-driven methods, or combined approaches. The session aims to bring together advances in computational modeling that support the design, optimization, and reliable application of these materials and structures.

Keywords: 3D/4D Printing; Functional Materials; Multimaterial Structures; Smart Materials; Simulation and Modeling.