

Composites Manufacturing and 3D Printing: Advances in Modeling, Design, Fabrication, and Applications

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Elyas Goli, The University of Illinois at Urbana-Champaign Abstract: Polymer-matrix composites and 3D-printed polymeric materials are integral to today's aerospace, automotive, marine, and energy industries and will be vital to the next generation of lightweight, energy-efficient structures in these enterprises, owing to their excellent specific stiffness and strength, as well as their ability to challenge classic manufacturing requirements and conventional geometrical restrictions. These unique features have brought a lot of attention from both academic and industrial perspectives, resulting in an exponentially-increasing trend in developments in this field. The objective of this mini-symposium is to focus on the recent developments in this area with an emphasis on modeling, design, fabrication, and applications. Topics invited include but are not limited to: - Additive manufacturing and 3D printing - Fiber-reinforced polymer-matrix composites - Multiphysics modeling of composites manufacturing and 3D printing - Machine learning and smart manufacturing - Molecular- and continuum-level approaches - Out of Autoclave (OOA) and Out of Oven (OOO) curing - Thermoset polymers and composites - Instability of resin during the manufacturing

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