

Special Issue

Micromechanical Analysis of 3D Printed Fiber-Reinforced Composites

Message from the Guest Editors

The advent of 3D printing technology has revolutionised the design and fabrication of fibre-reinforced composites, enabling unprecedented levels of customisation, geometric complexity, and material efficiency. These capabilities have positioned 3D printed composites as a key enabler for next-generation applications in aerospace, automotive, healthcare, and renewable energy sectors. Despite these advancements, challenges remain in understanding and optimising the mechanical performance of these materials. Issues such as fibre alignment, interfacial adhesion, void formation, and anisotropic behaviour significantly influence the structural integrity and durability of 3D printed composites. This Special Issue (SI) focuses on leveraging micromechanical analysis to address these emerging challenges, and aims to bridge the gap between material design and performance prediction. We invite contributions on topics including, but not limited to, multiscale modelling, experimental characterisation, process–structure–property relationships, and the development of innovative methods to enhance the mechanical performance of 3D printed fibre-reinforced composites.

Guest Editors

Dr. Ray Wan

School of Engineering, University of Hull, Hull HU6 7RX, UK

Prof. Dr. Han-Yong Jeon

Department of Chemical Engineering, Inha University, Incheon 22212, Republic of Korea

Deadline for manuscript submissions

20 October 2025



Applied Sciences

an Open Access Journal
by MDPI

Impact Factor 2.5
CiteScore 5.5



mdpi.com/si/233769

Applied Sciences
Editorial Office
MDPI, Grosspeteranlage 5
4052 Basel, Switzerland
Tel: +41 61 683 77 34
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As the world of science becomes ever more specialized, researchers may lose themselves in the deep forest of the ever increasing number of subfields being created. This open access journal Applied Sciences has been started to link these subfields, so researchers can cut through the forest and see the surrounding, or quite distant fields and subfields to help develop his/her own research even further with the aid of this multi-dimensional network.

Editor-in-Chief

Prof. Dr. Giulio Nicola Cerullo
Dipartimento di Fisica, Politecnico di Milano, Piazza L. da Vinci 32,
20133 Milano, Italy

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