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Additive Manufacturing: Experiments, Simulations and Data-Driven Modelling

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Deadline for manuscript submissions:

closed (20 March 2024)

Message from the Guest Editors

Additive manufacturing (AM) utilizes a layer-upon-layer technique to produce three-dimensional (3D) components via a computer-aided design (CAD) model, promising manufacturing advantages compared to conventional approaches, such as manufacturing intricate geometries, controlling the heat-affected zone and removing numerous technological steps; thus, reducing the final manufacturing cost. AM has been explored in automotive, biomedical, aerospace and industrial applications based on the facts mentioned above, and has been widely applied to various materials, including metals, ceramics, polymers and ceramic-reinforced metal matrix composites (CMMCs), a mixture of metals and ceramics. In AM, operating conditions influence the properties of the manufactured parts and the in-service life. One way to determine the optimum operating conditions is to conduct a series of experiments by utilizing the trial-and-error method, increasing the manufacturing direct and indirect costs. On the other hand, this can be performed by using an experimentally validated simulation model linked with data-driven models (machine learning), leading towards smart manufacturing.

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Message from the Editor-in-Chief

Welcome to *Crystals*, the journal dedicated to the fascinating world of crystallographic research! Crystals are more than mere decorative elements; they hold the key to understanding the fundamental structure of matter. Our mission is to explore the crucial significance of this research across various fields. From medicine to technology, chemistry to geology, crystals play a vital role. Their structure provides insights into new advanced materials, innovative drugs, and groundbreaking technologies. Through *Crystals*, we delve into the microscopic world to discover solutions that will shape the future. Join us on a journey through the *Crystals*, where science merges with beauty and innovation.

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Journal Rank: JCR - Q2 (*Crystallography*) / CiteScore - Q2 (*Condensed Matter Physics*)

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