Special Issue

Microstructural and Technological Aspects of Directed Energy Deposition

Message from the Guest Editors

Research on the technical mechanisms of directed energy deposition (DED) affecting the crystallography and microstructure of metals has emerged as a critical area of inquiry. DED, a layer-by-layer fabrication technique, enables complex geometries and material customization. It is of paramount importance to elucidate how process parameters and thermal histories influence grain morphology, phase transformations, microstructural evolution, and crystallographic texture during directed energy deposition.

Moreover, finite element simulations and computational analyses have become increasingly instrumental in predicting thermal history. Advanced simulation approaches can also model microstructural evolution, including grain morphology, phase distributions, and crystallographic texture, thereby enabling the prediction and control of microstructural anisotropy inherent to the DED process.

For these reasons, this Special Issue aims to collect papers focused on the technologies of the DED family in order to highlight the microstructural features and their effects on mechanical performance, scalability, and industrial applications.

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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.

Editor-in-Chief

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