

Special Issue Reprint

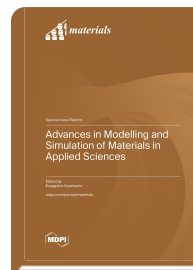
Advances in Modelling and Simulation of Materials in Applied Sciences

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The Reprint of the Special Issue “Advances in Modelling and Simulation of Materials in Applied Sciences” presents recent developments in methods and applications of material modelling and simulation across a wide range of applied science fields. It features advanced approaches such as finite element simulations, multiphysics modelling, ab initio and molecular dynamics simulations, and structural optimization. Applications span mechanical and manufacturing engineering, mechanical behavior and characterization of materials, thermomechanics and thermohydrodynamics, vibration and acoustics, and fluid dynamics, with materials ranging from metals and alloys to composites, fibrous media, metamaterials, and multifunctional structures. Within this context, the contributions of the Special Issue are organized into five themes: (i) finite element simulations in mechanical and manufacturing engineering; (ii) mechanical behavior and characterization of materials; (iii) reliability and vibration performance of engineered systems; (iv) thermohydrodynamic multiphysics modelling; and (v) ab initio and atomistic modelling of materials. Together, they demonstrate how simulations not only predict outcomes but also complement experiments in guiding design, processing, and optimization. This collection serves as a valuable reference for researchers, physicists and engineers seeking the latest advances in computational materials science and novel methods for material processing and characterization across multiple scales.

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