

Special Issue

Advances in Mechanical, Thermal and Electrical Properties of Polymer Nanocomposites

Message from the Guest Editor

We are currently witnessing remarkable progress in understanding and tailoring the mechanical, thermal, and electrical properties of polymer nanocomposites. Appropriate control of percolated or segregated filler networks can directly influence their stiffness, toughness, conductivity, and heat transport. The interfaces between polymer chains and fillers are decisive for these properties. They govern stress transfer, phonon scattering, and charge transport at the nanoscale, and when designed with suitable chemical functionalization, interfacial modifiers, or graded architectures, they minimize interfacial resistance, improve adhesion, and generate multifunctional coupling effects. The polymer architecture itself—including void regions, fractal morphologies, and hierarchical arrangements—further determines how nanoscale interactions manifest in bulk performance. This Special Issue invites contributions addressing the mechanical, thermal, electrical, and coupled properties of polymer nanocomposites, with emphasis on interfacial characterization, the impact of filler distribution, and multiscale structure–property relationships.

Guest Editor

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Message from the Editor-in-Chief

Nanoscience and nanotechnology are exciting fields of research and development, with wide applications to electronic, optical, and magnetic devices, biology, medicine, energy, and defense. At the heart of these fields are the synthesis, characterization, modeling, and applications of new materials with lower nanometer-scale dimensions, which we call “nanomaterials”. These materials can exhibit unusual mesoscopic properties and include nanoparticles, coatings and thin films, metal–organic frameworks, membranes, nano–alloys, quantum dots, self-assemblies, 2D materials such as graphene, and nanotubes. Our journal, *Nanomaterials*, has the goal of publishing the highest quality papers on all aspects of nanomaterial science to an interdisciplinary scientific audience. All of our articles are published with rigorous refereeing and open access. We are proud of our increasing impact factor and ability to provide rapid decisions to authors.

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