Special Issue

Charge Dynamics at the Nanoscale

Message from the Guest Editors

Charge transport, accumulation, and discharge are important phenomena in power, electrical, and related materials. Over the last several decades, the understanding of the charge dynamics of materials has extended from the macroscale to micro-meter scale. Furthermore, this knowledge has greatly improved power, electrical, and electronic applications. However, most of the theories on charge dynamics are discussed in the nanometer scale, such as Schottkey injection, Tunnelling theory, and hopping theory. The discovery of charge dynamics at the microscale is not yet deep enough to improve theories and build a link with the charge dynamics of materials in the nanostructure. On the one hand, we lack experimental tools or methods to exactly detect charge dynamics at the nanoscale. Additionally, we lack valid models and effectively accurate simulation methods to calculate charge dynamics at the nanoscale. This Special Issue aims to call for existing works to reveal charge dynamics in the nanoscale and to improve our understanding of the relationship between charge dynamics at the nanoscale and the nanostructure of the materials. Original research articles and reviews are welcome.

Guest Editors

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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.

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