Special Issue

Tuning Interfaces for High-Efficiency Solar Cells: Insights into Nano-Scale Mechanisms and Material Design

Message from the Guest Editor

The efficiency of solar cells is profoundly influenced by the interactions that occur at material interfaces. Understanding the interactions that govern light-harvesting, charge separation and transport, various types of losses, and degradation mechanisms is crucial for the design of high-efficiency photovoltaic devices. Articles and review papers are invited to explore the physical, chemical, and electronic properties of interfaces in a wide range of photovoltaic technologies, including perovskite, organic, quantum dot, and nanostructured silicon solar cells. Topics of interest include, but are not limited to, the following:

- Interface modifications through passivation, doping, or heterostructure engineering;
- Charge transport and energy alignment at nanomaterial interfaces;
- Plasmonic and photonic effects at interfaces for improved light absorption and energy harvesting;
- Advanced characterization techniques for probing interfacial dynamics;
- Stability and degradation mechanisms related to interfacial phenomena;
- Computational modeling and simulations to explain and predict charge transport and material interactions.

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.

Editor-in-Chief

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