

Special Issue

Nanoscale Photovoltaics Devices and Materials

Message from the Guest Editor

The continuous pursuit of high-efficiency, low-cost, and flexible photovoltaic (PV) technologies has placed nanoscale photovoltaics at the forefront of next-generation solar energy research. The unique properties of nanomaterials, such as size-tuneable bandgaps, enhanced light absorption, and improved charge carrier dynamics, offer transformative potential for solar cell design, fabrication, and performance optimization. As the global demand for sustainable energy solutions grows, understanding and harnessing nanoscale phenomena in photovoltaic materials and devices has become increasingly crucial. This Special Issue will provide a comprehensive platform for sharing the latest advancements in nanoscale photovoltaic research, in line with the journal's scope, covering cutting-edge nanoscience and energy applications. We welcome contributions that explore fundamental mechanisms, novel material synthesis, interface engineering, device architectures (e.g., perovskite–silicon tandems, quantum dot photovoltaics, nanowire junction cells, and plasmonic-enhanced hybrids), and in situ/operando characterization techniques at the nanoscale.

Guest Editor

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Editor-in-Chief

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