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Research Progress on Quantum Dot Solar Cells

Guest Editor:

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Message from the Guest Editor

During the last decades, we have experienced dramatic progress in the field of quantum dot solar cells (QDSCs) based on the significant advances in materials and device engineering. Now, the QDSCs achieved the best power conversion efficiency of 16.6% (https://www.nrel.gov/pv/cell-efficiency.html) in a single junction architecture. In addition, the QDs are attractive nanomaterials for optoelectronics since they harvest photons in the infrared region of the solar spectrum beyond the absorption cut-off of crystalline silicon (cSi) (Eg = 1.1 eV) and perovskites (Eg = 1.58 eV). This makes QDs a promising enabler of multi-junction photovoltaics.

This Special Issue aims to provide an overview of recent advances on QDSCs. Potential topics include, but are not limited to, QD synthesis, inorganic halide passivation, solution-phase ligand exchange, interfacial engineering, and device architecture. Recent efforts to develop Pb-free materials and perovskite-type QDs are also warmly welcome.

Keywords: Quantum dot solar cells; surface passivation; ligand exchange; lead-free QDs; perovskite-type QDs; interfacial engineering

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Message from the Editor-in-Chief

As the world of science becomes ever more specialized, researchers may lose themselves in the deep forest of the ever increasing number of subfields being created. This open access journal Applied Sciences has been started to link these subfields, so researchers can cut through the forest and see the surrounding, or quite distant fields and subfields to help develop his/her own research even further with the aid of this multi-dimensional network.

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