Special Issue

Advances in Perovskite Solar Cells: Recent Advances and Future Prospects

Message from the Guest Editors

The escalating global energy crisis has accelerated the development of photovoltaic technology, which offers unparalleled advantages in non-pollution and sustainability. Notably, perovskite-based solar cells are regarded as a revolutionary next-generation photovoltaic product due to their high efficiencies, low-cost fabrication, and versatile optoelectronic properties. Over the past decade, considerable efforts, including compositional tuning, interface and defect passivation, device architecture optimization, and durability enhancement, have been directed toward optimizing the performance of perovskite-based solar cells and advancing their commercial viability. However, a significant ideal-reality discrepancy between their actual efficiency and Shockley–Queisser theoretical limit indicates room for further performance improvements. Therefore, it is important to continue enhancing the efficiency and stability of perovskite-based solar cells. This Special Issue aims to foster discussions that will drive perovskite-based solar cells toward practical applications and establish them as a central element in next-generation photovoltaic technologies.

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Materials (ISSN 1996-1944) was launched in 2008. The journal covers twenty-five comprehensive topics: biomaterials, energy materials, advanced composites, advanced materials characterization, porous materials, manufacturing processes and systems, advanced nanomaterials and nanotechnology, smart materials, thin films and interfaces, catalytic materials, carbon materials, materials chemistry, materials physics, optics and photonics, corrosion, construction and building materials, materials simulation and design, electronic materials, advanced and functional ceramics and glasses, metals and alloys, soft matter, polymeric materials, quantum materials, mechanics of materials, green materials, general. *Materials* provides a unique opportunity to contribute high quality articles and to take advantage of its large readership.

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