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CHEMPHYSCHEM Editorial

Hybrid Assemblies for Light-Energy Conversion

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During the last decade, we have seen a surge in research interest in designing organic–inorganic hybrid assemblies for light-energy conversion. Many of the developments in dye-sensitized solar cells, quantum-dot solar cells, and organic photovoltaics have led to the design of high-efficiency metal halide perovskite photovoltaic devices. The record efficiency of 25.2% of the perovskite solar cell puts it in the same class as other high-efficiency solar cells such as silicon. At the same time, these hybrid perovskite semiconductors provide a continued source of innovation and creativity in the physics and chemistry of materials. Another important development is to boost the photoconversion efficiency through tandem design using two or more different bandgap semiconductor materials. The metal halide perovskite–Si-based tandem solar cell has already delivered an efficiency greater than that of Si solar cells. In addition to their photovoltaic properties, these materials also exhibit many intriguing optical and electronic properties. The design of solution-processed nanocrystals and 2D nanostructures has further expanded the scope of research in this field.

This special issue is a collection of recent advances in light-energy conversion using metal halide perovskites, semiconductor nanostructures, and other assemblies. The papers published in this issue mainly focus on the fundamental aspects of the light-harvesting phenomenon. We hope that the readers will find these articles useful in their research and gain additional insight into the latest developments in the field. We would like to thank all the authors for contributing to this special issue.

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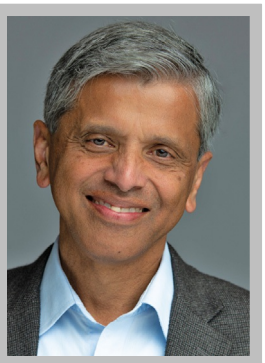

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