

Special Issue

Advancements in Solar Cell Technologies: From Efficiency Breakthroughs to Novel Materials and Manufacturing Processes

Message from the Guest Editors

Tapping the vast energy available from the sun in the form of electricity and chemical fuels has tremendous potential to address the global energy supply and climate change. Over the years, power conversion efficiencies have drastically improved due to both material innovation and advanced processing techniques. Further advancements in solar cell technologies are crucial to reducing the total cost of solar energy. Perovskite-based solar cells are characterized by their low-cost fabrication and exceptional light-absorption properties. They demonstrated excellent efficiency improvements within a very short timespan. However, CIGS-, CZTS-, and Sb₂Se₃-based solar cells have the potential to become next-generation solar cells due to the advantages of abundant and environmentally friendly materials. These thin-film-technology-based solar cells offer a pathway to efficient energy conversion while addressing resource constraints. Continuous research is highly desired to enhance their performance, stability, and scalability, as well as to reduce costs.

Guest Editors

Dr. Xiaojie Xu

Dr. Sudhanshu Shukla

Dr. Sandeep Kumar Maurya

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Energies
Editorial Office
MDPI, Grosspeteranlage 5
4052 Basel, Switzerland
Tel: +41 61 683 77 34
energies@mdpi.com

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Energies is an international, open access journal in energy engineering and research. The journal publishes original papers, review articles, technical notes, and letters. Authors are encouraged to submit manuscripts which bridge the gaps between research, development and implementation. The journal provides a forum for information on research, innovation, and demonstration in the areas of energy conversion and conservation, the optimal use of energy resources, optimization of energy processes, mitigation of environmental pollutants, and sustainable energy systems.

Editor-in-Chief

Prof. Dr. Enrico Sciubba

Department of Mechanical and Industrial Engineering, University
Niccolò Cusano, 00166 Roma, Italy

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