

Next-Generation Solar Cells

Session co-chairs: Hugh Hillhouse, University of Washington, and Marko Topič, University of Ljubljana

The price of electricity from solar panels has dropped dramatically over the past decade, and the currently installed global capacity is over 300 GW (peak), with about 70 GW (peak) installed in 2016 alone. However, new materials and devices may be able to significantly decrease the cost even further, enabling a rapid revolution of solar power. Hybrid perovskite materials in particular offer the possibility of dramatically low-cost, high-efficiency, printable solar cells that may be used as a single junction or added to existing technologies like silicon or CIGS to form high efficiency tandem solar cells. These exciting materials exhibit unprecedented quality for a printed semiconductor, with optoelectronic properties on par with the best inorganic semiconductors like GaAs. The session will focus on next-generation solar cells, particularly emphasizing the promise and grand challenges of these new materials, including the challenges of environmental stability and durability.

Speakers:

The Future for Second- and Third-Generation Photovoltaics

Dirk Weiss, First Solar

Perovskite/Silicon Tandem Solar Cells and Modules

Bernd Rech, Helmholtz Zentrum, Germany

Perovskite Quantum Dots: A New Absorber Technology with Unique Phase Stability for High Voltage Solar Cells

Joseph Luther, National Renewable Energy Laboratory

Insights to High-Efficiency CGIS Thin-film PV Solar Cells and Tandem Devices with Perovskites

Stephan Buecheler, EMPA, Switzerland