

## Special Issue on Nanostructured Solar Cells

# CALL FOR PAPERS

We kindly invite you to be part of this special issue which is intended to collect a series of papers in the thematic nanostructured solar cells. Nanostructured materials, such as nanowires, nanorods, and quantum dot structures, are being studied and developed for solar cell applications since they have enabled the fabrication of high efficient and low-cost devices.

It is believed that there are mainly two approaches to reduce the cost per kilowatt-hour of electrical energy generated by solar cell devices. Firstly, one can aim to increase the efficiency of the device, usually by pursuing new cell designs that can take full advantage of high-quality absorber materials. Secondly, one can pursue cost reductions while maintaining the efficiency of the device, often done by exploring novel manufacturing approaches but also sometimes with new cell designs and perhaps by exploiting lower-quality, cost attractive materials and processes. From either perspective, nanostructuring of inorganic solar cells offers the possibility of reducing the cost of photovoltaics by allowing smaller amounts of lower-grade photovoltaic semiconductor materials to be used or improving the photoelectric conversion efficiency by making more light and charge carriers to be harvested. The device physics including carrier/excitons separation, charge extraction, and recombination is strongly influenced by the nanostructures. Research in various fabrication methods and their influence on the device physics has also provided insight into how to increase efficiency limits. Additionally, the synthesis of solar cells by solution-based methods or fabrication pathways using less traditional, abundant materials is identified as a promising route to wide-scale photovoltaic electricity generation. Nanostructured solar-cell geometries are highlighted as essential in this approach.

Potential topics include but are not limited to the following:

- ▶ Nanowire solar cells
- ▶ Bulk nanostructured materials and nanoparticles/quantum dots/nanowell based solar cells
- ▶ Nanostructured solar cells based on upconversion/downconversion concepts
- ▶ Plasmonics for solar cells
- ▶ Organic/inorganic hybrid solar cells
- ▶ Nanostructured device physics and materials compositions
- ▶ Large area nanostructured device patterning/coating
- ▶ Simulation, modeling, and experimental work on nanostructured materials concepts for light trapping
- ▶ Solution processed nanostructured solar cells, and so forth
- ▶ Cost effective nanostructured solar cells technologies and challenges
- ▶ Power converters for nanostructured solar cells: design, control, and energy management strategies for grid-connected and stand-alone solutions
- ▶ Applications of nanostructured solar cells: for harvesting systems
- ▶ Photostability of nanostructured solar cells

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