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Organic and hybrid organic-inorganic concepts for photovoltaic energy conversion

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**Abstract content
 (Max 300 words)
Formatting &
Special chars**

Thin film photovoltaics (PV) attracts much attention as a promising source of renewable energy to reduce the dependencies on fossil and nuclear sources of energy. The advantage of using polymers and molecules in electronic devices, such as light-emitting diodes, field-effect transistors and solar cells (OPV) is justified by the unique combination of the potentially high device performance and processability of the semiconductors used in the active layer. Power conversion efficiencies of nanostructured organic solar cells are in the range of 10-12% on a lab scale, making them ready for commercialization, e.g. in building integrated PV. The operation principles of this type of solar cells are quite different from those we know for inorganic solar cells, based e.g. on Si or CIGS. Recently, photovoltaics based on methylammonium lead halide perovskites (PSC) having excellent semiconductor properties and leading to efficient solar cells in excess of 16% have attracted much attention. However, not everything is clear about the general working principles in this new class of solar material. I will present the state of the art in both fields, OPV and PSC and discuss the mechanisms governing the charge carrier generation, recombination and transport.

**Apply to be
 considered for a student
 award (Yes / No)?**

No

**Level for award
 (Hons, MSc,
 PhD)?**

N/A

**Would you like to
 submit a short paper
 for the Conference
 Proceedings (Yes / No)?**

Yes

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