

## Summery

To date materials for organic solar cells are matters of vigorous research improving their absorption and charge transport properties, as well as enhancing their stability. These features are especially of importance when creating new concepts for third generation organic solar cells for new applications i. e. as flexible energy sources in vehicle interiors revealing device lifetimes of several years. The new concept, we will pursue over the next six years, is based on three components. Firstly the basis is on new organic dendimers, revealing a strong assembly tendency and that are responsible for UV-Vis absorption. Secondly on fullerene moieties, those are taking over the role of the electron acceptor for efficient charge separation and electron transport in the films. The third component consists of lead chalcogenide nanocrystals, modified with organic dendrons, active in the near-infrared that will act as sensitizer, transferring charges out of near-infrared photons to the organic layer. This concept allows for a fine-tuning of the absorption properties, charge transport and, importantly, of the morphological properties of the photovoltaic films. In the first two years period of the project, we will focus on the synthesis and optimization of the first design of organic materials and the spectroscopic investigation and enhancement of charge generation, electron transfer, and charge transport in the novel material composition. Morphological investigation of the stacking assembly behavior of the films will be addressed as well, followed by a detailed exploration of the solar cell characteristics of the first generation materials selection. As a reference to the proposed new three component hybrid system, we will in the first year also investigate the pure all organic system.