

## Projekt Summary 6

### **p-B-n organic junctions for efficient photovoltaics**

The power conversion efficiency of organic solar cells is limited by the low absorption capabilities of the thin active layer, recombination losses due to poor morphology and limited transport properties. In order to further improve device efficiencies these limitations must be addressed. In this proposal we aim to exploit the vertically structured active layer with enhanced transport properties which we developed in the last funding round to overcome some of these limitations. The structure consists of a polymer:fullerene bulkheterojunction (B) sandwiched between a hole transport layer (p) at the anode and an electron transport layer (n) at the cathode to create the **p-B-n junction**. The p-B-n junction allows for thicker active layers with increased absorption combined with favorable charge transport due to the vertically ordered structure.

In previous results we demonstrated that molecular doping can be an effective method to reduce recombination, improve transport, and increase the photocurrent in the solar cell. In this funding round we intend to investigate the use of self-assembly to achieve a controlled positioning of dopants in p-B-n junctions. Here, we propose to examine the feasibility of new materials and structures for controlling the absorption, recombination and electrical properties in organic photovoltaics.