

Summery

Organic donor and acceptor molecules represent an important class of materials for solar energy conversion. The focus of this project is to combine the expertise of four groups to address central issues for photovoltaic cells based on these materials. These are: film structure and morphology, electronic structure at interfaces, excitonic processes and charge transport. The goal of this multilateral approach is to develop a detailed understanding of the correlation between structural and electronic properties, microscopic transport phenomena and macroscopic parameters determining solar cell performance for different prototypes of donor/acceptor pairs. This knowledge will enable us to control the growth of films with favourable conditions for exciton and charge transport in both the donor and acceptor phase and efficient charge separation and extraction at the involved interfaces. Starting from a planar heterojunction we will proceed to more complex structures, including interdigitated organic/organic interfaces and bulk heterojunctions to achieve this goal. Our work is a concerted effort to investigate and correlate various aspects of the individual materials and their combinations by bringing complementary competencies together in a joint project.