

VISION ON FUNCTIONAL NANOSTRUCTURES

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Functional nanostructures play a dominant role in the research and development area of organic electronics and in particular for the photoactive layer of solar cells. However, controlling their organization and aggregation behavior on the different length scales from molecular interfaces to percolating networks and whole devices still is a challenge. Utilizing fundamental materials physics principles like the use of phase diagrams and forced assembling and demixing of nanostructures with tuned organization and properties interesting structure-property relations can be established. In this respect, visualizing the nanostructures and quantifying their shapes, aspect ratio and overall organization in the volume of the photoactive layer and in contact with the charge collecting electrodes by means of high-resolution microscopy techniques helps us better understanding the nanoworld of such devices; and ultimately creates a vision on the next steps we have to do towards the ultimate performance of devices.