

Speaker Abstracts Karlsruhe Days of Optics & Photonics



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The power of light – pushing the limits of solar energy conversion

Current energy production methods require a revolutionary shift away from historical, unsustainable practices. Technologies which harvest and convert sunlight to electricity are on the brink of creating such a revolution. The Saive research group develops light management strategies – combining realistic solar irradiance conditions with nanophotonics – that drive conversion efficiency of photovoltaic devices toward their upper limits. Our main focus areas are development of effectively transparent front contacts and design of nanophotonic albedo materials for bifacial solar power plants. The former enhances power conversion efficiency of almost all types of solar cells by mitigating shading losses related to electrical front contacts. In the second focus, the optical environment of solar power plants is designed to redirect light towards the solar modules.