

The Material's Genome Quest: Researching High Throughput Methods for Functional Electronics

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Solution processed semiconductors play an essential role in the future renewable energy scenarios where power generation by photovoltaics will be one of the pillars for the world's clean energy supply. The printed organic photovoltaics technology has evolved from the 1 % regime in the 90s to the 10 % regime nowadays. Perovskite semiconductors have lead the efficiency pathway of printed semiconductors beyond the 20 % regime. Most interestingly, some candidates of the most recent generation of high performance materials show a number of unforeseen microstructure related degradation mechanisms, which are closely related to their performance.

Recent advances in material and device processing have opened a venue to introduce high-throughput and combinatorial methods into the photovoltaics research. First experimental investigations underpin the complexity to introduce high throughput systematics as a concept for device engineering as compared to material designing. The last part of the presentation will introduce into the concept of robot based systems as a hardware platform for high throughput device engineering.

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He received his PhD (1995) in physical chemistry from Linz university, joined the group of Prof Alan Heeger at UCSB for a sabbatical, and continued to work on all aspects of organic semiconductor spectroscopy as assistant professor at Linz university. He joined the SIEMENS research labs as project leader for organic semiconductor devices in 2001, finished his habilitation in physical chemistry in 2003 at Linz university and joined Konarka in 2004, where he was holding the position of the CTO before joining Friedrich-Alexander University Erlangen-Nürnberg.