

### Plenary Talk

PV IV Mon 18:00 H1

#### Organic Semiconductors: From Lab Curiosities to Products

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Organic semiconductors with conjugated electron system are currently intensively investigated for electronic and optoelectronic applications. This interest is spurred by novel devices such as organic light-emitting diodes (OLED) for flexible displays and lighting, or organic solar cells. When the first devices were demonstrated about 20 years ago, they had lifetimes measured by minutes. However, there has been tremendous progress and recent devices have achieved outstanding efficiencies and lifetimes. In this talk, I will review some of this recent progress and discuss in particular highly efficient OLED and solar cells using

doped transport layers /1/. White OLED have recently achieved very high efficiencies of 90lm/W, significantly higher than fluorescent tubes, opening the path to a new form of high-efficiency area lighting devices /2/. For organic solar cells, electrically doped transport layers allow an optimized optical design and efficient charge recombination junctions for tandem cells. Recently, we have achieved solar cells with certified efficiency exceeding 6% on larger areas.

/1/ K. Walzer et al., Chem. Rev. 107, 1233 (2009) /2/ S. Reineke et al., Nature 459, 234 (2009)

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