

Transfer Offer 22-06

Disordered Semiconductors



Description

The research group "Optoelectronics of Disordered Semiconductors" of Prof. Dr. Safa Shoaee is interested in understanding and developing low cost, large area environmentally benign photovoltaic technologies. Therefore the team is studying disordered carbon-based semiconductors, in particular organic semiconductors, to find out how these materials, electrically and optically

perform, and which of their properties influence how efficiently they convert light energy into electrical energy.

Organic solar cells have several advantages over conventional Silicon wafers: they are more mechanically flexible, light, colourful but also transparent, as well as cheaper and more environmentally friendly to manufacture. They exhibit the highest efficiency at lower light levels, making them ideal for applications Silicon based PV technology cannot achieve. In addition, interesting effects can be achieved by combinations with perovskite or other inorganic materials.

Methods used

- Steady state and transient opto-electrical characteristion techniques
- Device fabrication

Developmental status

- still under development
 - o Cooperations sought for commercial use of organic solar cells for cars

Scientific literature

- Shoaee et al.; Molecules 2021, 26, 24, 7439; <u>https://doi.org/10.3390/molecules26247439</u>
- Zeiske et al.; ACS Photonics 2022, 9, 4, 1188–1195; <u>https://doi.org/10.1021/acsphotonics.1c01532</u>
- Perdigón-Toro et al.; Advanced Energy Materials 2022, 12, 2103422; <u>https://doi.org/10.1002/aenm.202103422</u>
- Zuo et al.; Phys. Rev. Applied 2021, 16, 034027; https://doi.org/10.1103/PhysRevApplied.16.034027

Applications

- Home and IoT devices
- Solar cars

Keywords

- Optoelectronics
- Semiconductor
- Organic solar cells

Interest in cooperation

- Research based collaboration
- Industry sponsored research

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