

**Montag, 26.06.2023 um 15:15 Uhr**  
**R87, Wilhelm-Klemm-Str. 10**

## Insights into the physics of perovskite solar cells



© Prof. Dr. Thomas Fauster

### Prof. Dr. Thomas Fauster

Lehrstuhl für Festkörperphysik  
Friedrich-Alexander-Universität Erlangen-Nürnberg

Perovskite solar cells have made remarkable progress in the last decade. In this talk I will discuss some insights into the physics behind the exceptional properties of these materials: They are direct semiconductors with unusually long carrier lifetimes, which makes them ideal for solar cell and other applications. Two hypotheses are discussed to explain the long carrier lifetimes: (i) Rashba splitting of the bandstructure at the band edges which suppresses direct recombination due to spin-selection rules. (ii) Polaron formation due to the relaxation of the lattice after optical excitation. Our experiments provide evidence for both mechanisms, which hints to a complex entanglement of spin and lattice degrees of freedom.

