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Stuttgarter Physikalisches Kolloquium

Max-Planck-Institut für Festkörperforschung
Fachbereich Physik, Universität Stuttgart

Ansprechpartner: Eberhard Goering
E-Mail: e.goering@fkf.mpg.de
Telefon: 0711 689-1756

Dienstag, 8. April 2025 | **16.15 Uhr** | **Lecture Hall 2D5**

Max-Planck-Institut für Festkörperforschung, Heisenbergstraße 1, 70569 Stuttgart-Büsnau

Metal Halide Perovskites – Tuning the next generation of solar cells

Juliane Borchert
Fraunhofer ISE Freiburg

Abstract

Currently the vast majority of commercially available solar cells are based on the semiconductor silicon. In the last decades a lot of research and development has gone into the optimization of silicon solar cells. As a result, their efficiencies are now coming close to the theoretical limit for silicon and new strategies and materials are needed to further improve solar cells. A very promising group of materials are the metal halide perovskites. They combine many intriguing properties from a tunable bandgap to processibility at low temperatures. This has led to them being investigated for use in a wide range of semiconductor devices including solar cells and LEDs as well as photodetectors, transistors and even lasers. In this talk I will introduce the properties of this intriguing material class and show promising methods to scale it to industrial sizes. I will give insights into the advantages of vacuum-based deposition techniques and the high solar cell efficiencies that have been achieved with them. I will also illuminate which gaps in understanding need to be investigated further and how this research area may develop in the coming years.