

DS 12: Hertha Spohner Prize Talk

Time: Wednesday 17:30–18:00

Location: A 053

Prize Talk

DS 12.1 Wed 17:30 A 053

Metal Halide Perovskites - Tuning the Next Generation of Solar Cells — ●JULIANE BORCHERT — University of Freiburg INAT-ECH Solar Info Center, Emmy-Noether-Straße 2, 79110 Freiburg im Breisgau, Germany — Fraunhofer ISE Heidenhofstr. 2, 79110 Freiburg im Breisgau, Germany — Laureate of the Hertha-Sponer-Prize 2024

The looming climate crisis makes a rapid transition towards renewable energies necessary. One major contributor to this transition are photovoltaic solar cells. They enable us to harness the energy of the sun. 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 the-

oretical 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 you to 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.