

CONDENSED MATTER SEMINAR

Thursday 9 March at 14.30

Simpkins Lee room/Zoom

“Organic and Perovskite Photovoltaics: A story from fundamentals to Scale-up”



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Both organic and perovskite photovoltaics have shown remarkable advances in terms of materials, performance and lifetime over the last decade. Thus, they need to be understood and evaluated from fundamentals to paths to commercialization. For instance, fundamentally, control over perovskite intrinsic charge transport behavior such as electrical conductivity and Seebeck or doping halide perovskites have been overlooked. With the emergence of high-performance non-fullerene electron acceptors (NFA), organic photovoltaics (OPV) are particularly appealing as their power conversion efficiencies (PCEs) are approaching 20%. Understanding the fundamentals and identifying the sources of device degradation in photovoltaic devices is crucial from the manufacturing and commercialization point of view.

In the first part of my talk, I will show that controlling the A-site cation in tin perovskites offers tuning the electrical conductivity, which is in contrast to general assumption that A-site cation does not play significant role in determining the electronic properties and share dopant strategies for carrier tuning in this class of (Sn based) materials. In the second part, I will share the photo- and thermal- degradation behavior of the state-of-the-art nonfullerene OSCs in both indoor and outdoor conditions with multimodal characterizations and in-operando transient electro-optical spectroscopy and I will briefly touch base on my start-up journey ‘RedSea’.

Host: Pascal Kaienburg