



PHYSICS COLLOQUIUM

Speaker:

Dr. Johannes Benduhn

Dresden Integrated Center for Applied Physics and Photonic Materials (IAPP) and Institute of Applied Physics (IAP),
TU Dresden, Germany



Topic:

Organic photodetectors – toward high-performance, spectroscopic sensing

Introduction for habilitation

*Time and
place:*

Tuesday, June 6, 2023, **2:50 pm** – hybrid event

The colloquium will be held in REC/C213.

Online participation possible:

Zoom-Meeting: Meeting-ID: 631 3817 8900 / passcode: PK-SoSe23

<https://tu-dresden.zoom.us/j/63138178900?pwd=RVVZM3N4azdmNmVlQ2RWUTZ0TkhXdz09>

Host:

Prof. Karl Leo

Abstract:

Modern innovations such as heartbeat and blood-oxygen measurements in lightweight smart watches, food quality monitoring, and automated industrial production are driven by novel sensor technologies. In this regard, organic photodetectors promise significant advances due to their beneficial physical properties and low-cost production. Recent research has led to rapid improvement in all performance parameters of these detectors, which are now on par or even better than their inorganic counterparts, such as silicon or indium gallium arsenide photodetectors, in several aspects. In particular, it is possible to design organic photodetectors for specific wavelengths directly. This technical advantage makes expensive, bulky optical filters obsolete and allows miniature spectroscopic detector devices. In this presentation, recent advances in the field of organic photodetectors are shown, focusing on understanding the reverse dark currents in these devices and improving the spectral photoresponse utilizing photomultiplication processes. Additionally, it is shown how an advanced device architecture allows for highly integrated and application-specific sensor systems.

Bio:

Johannes Benduhn studied Physics at the University of Greifswald (Germany), University of Wrocław (Poland), and Technische Universität Dresden (Germany), where he obtained his Master of Science (2015) and Doctorate degree (2019) under the supervision of Prof. Koen Vandewal. Afterward, he joined the start-up Senorics GmbH, which expedites mobile spectroscopy solutions based on organic photodetectors. Currently, Johannes Benduhn is leading the research group "Organic Sensors and Solar Cells" at Technische Universität Dresden at the professorship of Prof.

Mitglied von:



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Karl Leo. His main research interests range from studying fundamental processes in organic semiconductors to improving optoelectronic devices by employing new materials and exploring new device architectures.