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Mid-Infrared Photonics: From Emerging Tool to Enabling Technology

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Vibrational spectroscopies - and especially infrared spectroscopy - play an increasingly important role in modern biodiagnostics, environmental analysis, and food safety/quality scenarios. This has led to the evolution of mid-infrared photonics from an emerging tool into an enabling technology.

With applications ranging from non-invasive exhaled breath analysis to in-vivo assessment of cartilage damage, mid-infrared (MIR; 3-20 μm) photonics ranges among the most flexible molecular sensing platforms nowadays available. In particular, with the emergence of quantum and interband cascade laser technology, the on-chip hybridization and/or integration of entire MIR sensing devices is on the horizon ultimately leading to IR-lab-on-chip systems. The inherent molecular selectivity of MIR signatures enables studying small molecules (e.g., volatile organic compounds; VOCs) in the gas phase, as well as biomacromolecules (e.g., proteins) in the liquid phase at unprecedented detail in a label-free and non-destructive fashion. Last but not least, the combination with advanced multivariate data evaluation and deep learning algorithms facilitates analyses in real-world complex mixtures in a wide range of demanding scenarios.

The discussion of latest MIR photonic technologies in this presentation will be augmented by highlight applications underlining the utility of next-generation MIR photonics.

Einladender: Prof. Dr. Michael Schäferling

Ort:
Raum D 145
(Gebäudeteil D, Parkplatz P3)
Stegerwaldstraße 39
48565 Steinfurt

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