UNIKASSEL VERSITÄT

Physikalisches Kolloquium

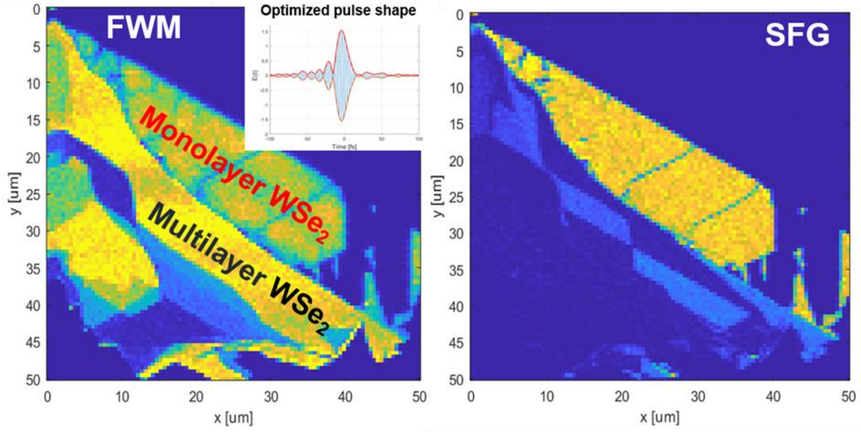
Thursday, 30.11.2023, 16:15, HS 100
Reception with coffee & cookies 16:00
(For university staff: please bring your own cup for sustainability reasons)

Prof. Dr. Achim Hartschuh, Department Chemie und CeNS,
Ludwig-Maximilians-Universität München:

Ultrafast Nonlinear Microscopy and Spectroscopy of 2D Semiconductors

Abstract

Nonlinear optical phenomena, such as sum frequency generation (SFG) and four-wave mixing (FWM), play a central role in various applications ranging from laser design and pulse characterization to optical sensing. Monolayer semiconducting transition metal dichalcogenides (TMDs) feature particularly strong nonlinear light-matter interactions which result from the large oscillator strength of tightly bound excitons. We investigate the nonlinear response of TMDs using phase-shaped broadband laser pulses. We find that the FWM response of TMDs can be coherently controlled by manipulating the spectral phase profile of the laser pulse depending on the exciton resonance energy. We then show that pulsed laser excitation at very high pump fluences can induce a Mott transition from an excitonic regime to an electron–hole plasma in mono- and few-layer TMDs.



All of you interested in physics are cordially invited!

Contact: Prof. Dr. Thomas Baumert, Dr. Arne Senftleben, Experimental Physics III, More Information: uni-kassel.de/go/physikalisches_kolloquium