KIDS TALK

"Science at the Timescale of the Electron: Tabletop Ultrafast X-rays for Material Science"

Speaker: Steffen Eich, AG Aeschlimann

Abstract: Ever since the invention of the laser 50 years ago, scientists have been striving to extend coherent laser-like beams into the soft X-ray region of the spectrum, which can open the possibility to image molecular and atomic motion on an ultrafast timescale. Very recently, we were able to create ultrafast bright light in the XUV regime by means of high-order harmonic generation (HHG) on a tabletop setup. The high energy pulses that are generated represent a coherent tabletop version of large scale facilities such as synchrotrons or FELs.

Those pulsed X-rays are powerful probes of the nanoworld on a femto/attosecond timescale. In combination with photoemission spectroscopy we can probe the fastest charge, spin and phonon interactions as well as energy transport processes in materials in real time. Therefor we create a non-equilibrium excitation by pumping the system with a high intensity laser pulse and monitor the induced dynamics with the HHG pulse. Examples include probing the dynamics in photo-induced phase transitions of correlated-electron materials like 1T-$TiSe_2$ and investigating the 3d transition metal Co by mapping spin-resolved band-structure modifications that evolve during the ultrafast demagnetization process after photoexcitation.

When: Friday, June 26th 2015, **10:00 am**

Where: Room 46-387/388

All undergraduate and graduate students as well as postdocs are welcome and encouraged to join our discussion!

For questions, comments or suggestions: vollmar@rhrk.uni-kl.de

********** COFFEE, TEA AND COOKIES WILL BE SERVED **********

MATERIALS IN SCIENCE MAINZ

TECHNISCHE UNIVERSITÄT KAISERSLAUTERN

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