

# KIDS TALK

## “Tabletop Ultrafast X-rays for Material Science: Probing the Nanoworld on a Femtosecond Timescale”

**Speaker:** Sebastian Emmerich, 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. 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. We therefore create a non-equilibrium excitation by pumping the system with a high intensity laser pulse and monitor the induced dynamics with the HHG pulse. Recently, we were able to combine this technique with a state-of-the-art spin detector which enables us to get new inside into the ultrafast demagnetization of ferromagnetic materials.

**When:** Friday, February 12<sup>th</sup> 2016, **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!

\*\*\*\*\* COFFEE AND COOKIES WILL BE SERVED \*\*\*\*\*

For questions, comments or suggestions: [schmidtf@physik.uni-kl.de](mailto:schmidtf@physik.uni-kl.de)

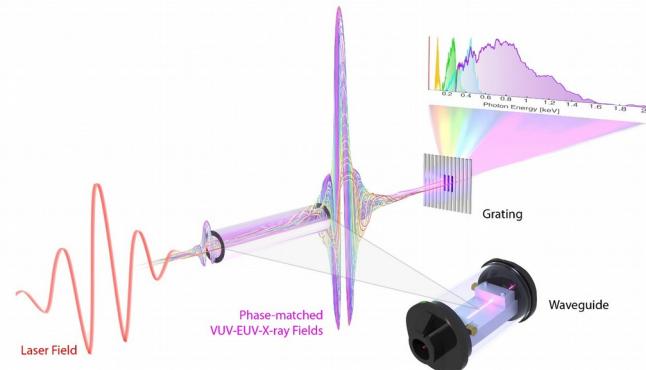


Fig.: High-Order Harmonic Generation in a hollow waveguide (image: Tenio Popmintchev and Brad Baxley, JILA and University of Colorado at Boulder)