



e-conversion



# Seminarankündigung

**Dienstag, 23. Juli 2019  
13:00 Uhr**

**ZNN, Seminarraum EG 0.001**

## **“Femtosecond point-projection microscopy – nanoscale imaging of charges in motion”**

Abstract: The ultrafast motion of charge carriers at the nanoscale plays a crucial role in our understanding of optoelectronic systems. To visualize ultrafast charge motion in real space, and at the nanoscale, we are currently developing femtosecond point projection microscopy (fs-PPM) – a pump-probe technique that uses low-energy (<200 eV) electrons as an imaging probe. In fs-PPM, a nanotip that serves as a point-like source of electrons, which are photoemitted by an ultrashort laser pulse, is positioned close to the sample such that the diverging electron beam projects a magnified image of the sample onto the detector. The PPM image is highly sensitive to local electric fields due to the use of low-energy electrons, and can be used to image ultrafast transient changes of the electric field distribution near nanoscale objects. This is demonstrated with experiments visualizing photo-induced currents in InP and GaAs nanowires. The sensitivity of this technique to nanoscale electric fields can be further enhanced, down to the level of a single elementary charge, by taking advantage of the phase information of the imaging electron wavepacket, i.e. electron holography. Our recent progress toward the development of femtosecond low-energy electron holography will also be reported.

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