CFEL SCIENCE

# SEMINAR

***28th September 2016 - 2:00 p.m.***

CFEL-bldg. 99, seminar room IV


## Daria Gorelova

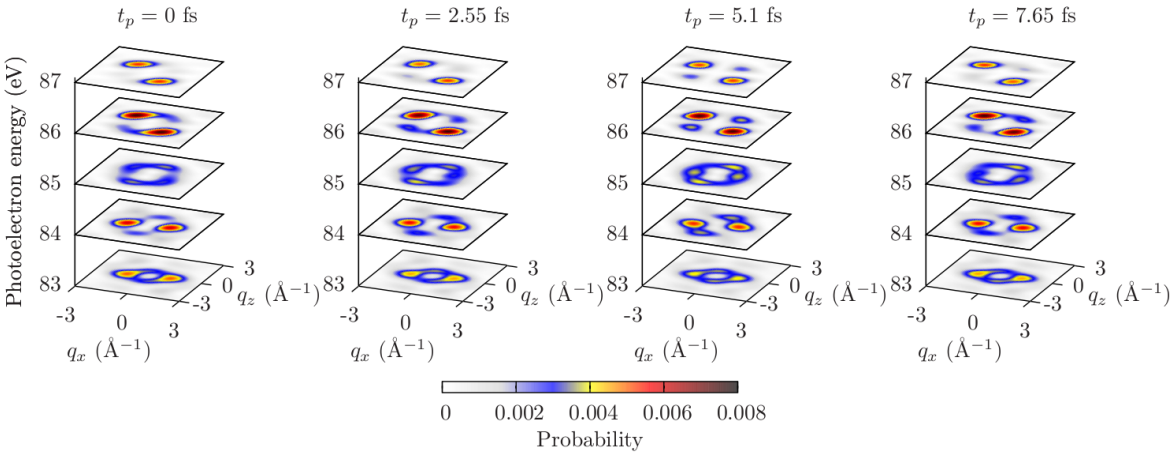
CFEL-DESY Theory Division


# Imaging molecular electron dynamics with time- and angle-resolved photoelectron spectroscopy


We theoretically study how time- and angle-resolved photoemission spectroscopy can be applied for imaging coherent electron dynamics in molecules [1]. We consider a process in which a pump pulse triggers coherent electronic dynamics in a molecule by creating a valence electron hole. An ultrashort extreme ultraviolet probe pulse creates a second electron hole in the molecule. Information about the electron dynamics is accessed by analyzing angular distributions of photoemission probabilities at a fixed photoelectron energy. We demonstrate that a rigorous theoretical analysis taking into account the indistinguishability of transitions induced by the ultrashort, broadband probe pulse and electron hole correlation effects, is necessary for the interpretation of time- and angle-resolved photoelectron spectra. We show how a Fourier analysis of time- and angle-resolved photoelectron spectra from a molecule can be applied to follow its electron dynamics by considering photoelectron spectra from an indole molecular cation with coherent electron dynamics.



[1] Daria Popova-Gorelova, Jochen Küpper and Robin Santra, Phys. Rev. A 94, 013412 (2016).


Host: Robin Santra – CFEL-DESY Theory Division