

FAKULTÄT für PHYSIK
LUDWIG-MAXIMILIANS-UNIVERSITÄT
MÜNCHEN/GARCHING

PHYSIK-DEPARTMENT
TECHNISCHE UNIVERSITÄT MÜNCHEN
MÜNCHEN/GARCHING

MLL-KOLLOQUIUM

Donnerstag, 17.05.2018, 16¹⁵ Uhr

Hörsaal der LMU in Garching, Am Coulombwall 1
Treffen zum gemeinsamen Kaffee 16 Uhr

Prof. André Knie

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Two-dimensional photon spectroscopy and its way to ultra-fast processes

Absorption and emission of photons are the most fundamental light-matter interactions. In typical 'from the bottle' atomic and molecular systems, XUV spectroscopy is regarded old-fashion science. Nevertheless, with the help of high flux, high tunability, high stability, and ultra-high resolution of modern synchrotron radiation facilities and 2D-photon spectroscopy, even H₂ can become interesting again. Together with an experimentalists-friendly theory, I will introduce in the first part, it reveals a marvelous wealth of information and ideas for exploitation via fs-laser based science. In the second part, I will highlight ultra-fast processes in more complex systems. Starting with interatomic Coulombic decay in dense noble gas clusters, which can be made visible by photon detection, releasing several strict demands of typical electron or ion spectroscopy. Contrastingly, new decay mechanisms, like the radiative charge transfer, will appear, which are often impossible to detect without the use of photon sensors. An outlook to electron photon coincidence measurements might stimulate ideas for processes not thought of, yet. The ultimate complexity of liquid water and its fickle nature give rise to ultra-fast photon emission, which cannot be time resolved without a pump-probe approach. In the last part however, we will see how two-dimensional photon spectroscopy yields an insight into the variety of deexcitation pathways of this system.

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