Hybrid-Kolloquium

RUN. Regensburg Center for Ultrafast Nanoscopy

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Time-resolved photoemission: from bandstructure to orbital movies

physikalisches Kolloquium

Mo. 21.11.22
16:00 Uhr
Ort: H34 &
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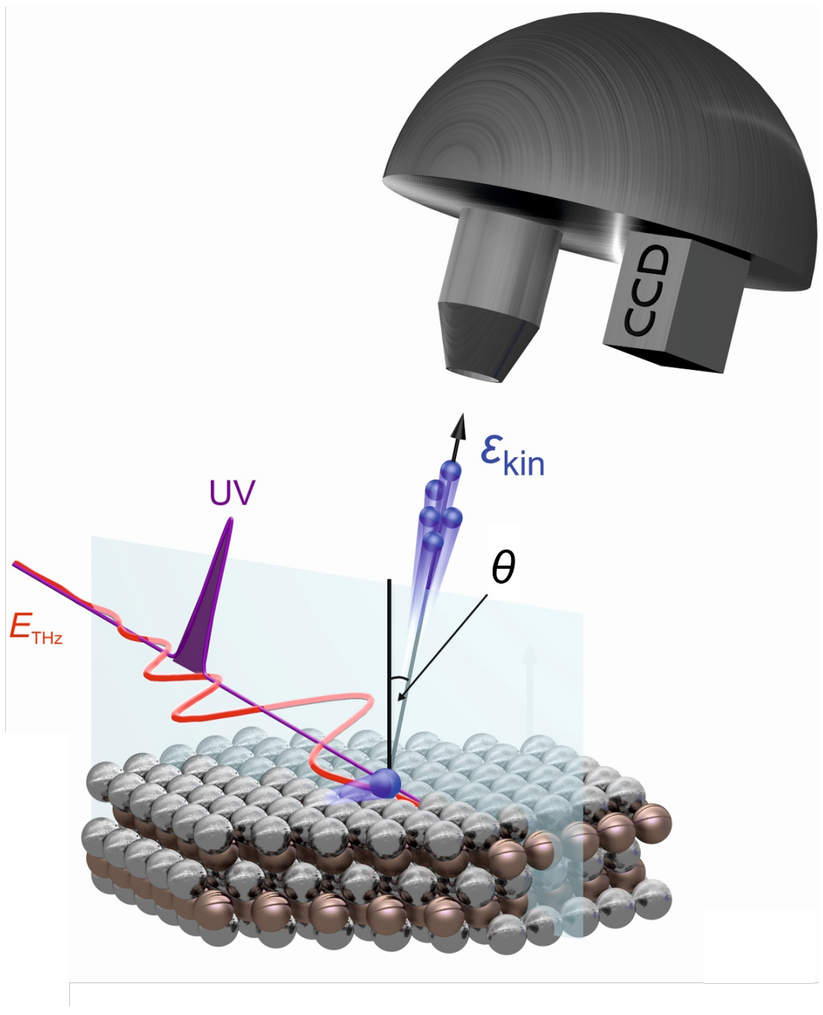
Time-resolved photoemission can track electron motion in 2d momentum space. This unique capability is the key to clear-cut experiments of ultrafast electron dynamics at surfaces, interfaces and 2d materials.

In this talk, I will briefly introduce the state-of-the art of the method and discuss a couple of examples from our recent work. These include bandstructure movies of the intraband acceleration of electrons in topologically protected Dirac surface states, of the birth and collapse of Floquet-Bloch states and of the formation of momentum-forbidden and spin-forbidden dark excitons in TMDC monolayers.

Finally, I will outline the perspectives of photoemission orbital tomography to take slow-motion movies of molecular orbitals while they are driven by lightwaves.



Schematic diagram of angle-resolved photoelectron spectroscopy (ARPES) of light-wave processes with sub-cycle time resolution [adapted from Reimann et al., Nature 562, 396 (2018)].

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