Physikalisches Kolloquium

Universität Konstanz

Di 10.01.17
15:15 Uhr
14:45 Uhr, Kaffee/Tee
R 513

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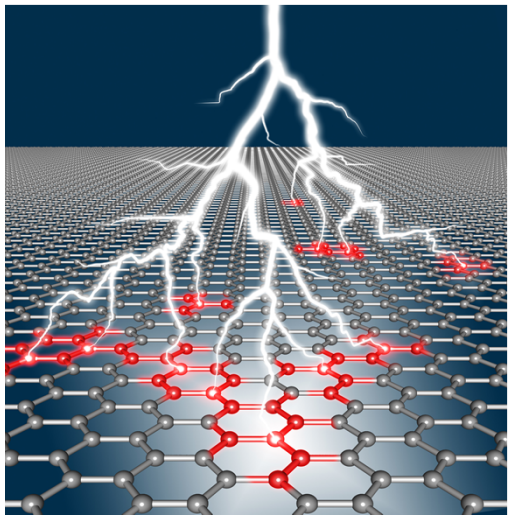
Dynamical Band Structure Engineering of Low-Dimensional Solids



Dynamical modulation with light has recently emerged as a new tool for electronic structure control, complementing more traditional routes such as chemistry, confinement, pressure, or magnetic fields. Famous examples include light-induced superconductivity in cuprates[1] and K_3C_{60}[2] far above the equilibrium critical temperature using resonant excitation of the crystal lattice, as well as the formation of photon-dressed Floquet-Bloch states inducing a topological phase transition in Bi_2Se_3[3].
I combine femtosecond excitation at tunable wavelengths from the near- to the mid-infrared spectral regime with an extreme-ultraviolet time- and angle-resolved photoemission probe for the electronic structure control of various low-dimensional solids. I will present our recent results on Dirac carrier dynamics in driven monolayer and bilayer graphene[4-7], and give an outlook on ongoing and future projects on other low-dimensional material systems.

[1]Hu et al., Nature Materials 13, 705 (2014)
[2]Mitrano et al., Nature 530, 461 (2016)
[3]Wang et al. Science 342, 453 (2013)
[4]Gierz et al., Nat. Mater. 12, 1119 (2013)
[5]Gierz et al., Phys. Rev. Lett. 114, 125503 (2015)
[6]Gierz et al., Phys. Rev. Lett. 115, 086803 (2015)
[7]Pomarico et al., arXiv1607.02314 (2016)