

## Strong-field physics with nanospheres

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Much of the fascinating physics of intense laser-matter interactions has been discovered on atoms and molecules in the gas phase. Such studies, however, cannot address the perspectives emerging from electronic strong-field dynamics in nanostructures and dielectric solids. In this talk I will discuss our recent work on the photoemission from dielectric nanospheres which has revealed important implications of local near field effects [1], field propagation [2], collective electron dynamics [3], and electron transport for the attosecond electron dynamics [4]. In particular, it will be discussed by which mechanism electron trapping can enhance the photoelectron energy cut-off, how phase-controlled laser fields can be used for directional control of the electron emission, and why this target class has opened the door to the direct measurement of inelastic collision times in dielectrics via attosecond streaking.

[1] S. Zherebtsov et al., *Nat. Phys.* **7**, 656 (2011)

[2] F. Süßmann et al., *Nat. Commun.* **6**, 7944 (2015)

[3] L. Seiffert, *J. Mod. Opt.* **64**, 1096 (2017)

[4] L. Seiffert, *Nat. Phys.*, published online, doi:10.1038/nphys4129, (2017)