

Kolloquium am 13.06.2018 im Max-Born-Saal

THz spectroscopy of solids with a free-electron laser

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I will start describing the Dresden free-electron laser FELBE as an intense, tunable, pulsed and narrowband source of infrared and THz radiation and the unique opportunities it offers for the spectroscopy of low-energy excitations in solids. In particular, the FEL can be used for nonlinear optical experiments, for time-resolved pump-probe studies, and also for near-field microscopy. I will mainly discuss nonlinear experiments on excitons in semiconductor quantum wells and pump-probe studies of the relaxation dynamics in graphene. If time permits, I will also introduce the new superradiant THz radiation source TELBE.