

PHYSIKALISCHES KOLLOQUIUM
EINLADUNG

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speaks

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about

**Terahertz spectroscopy: from ultrafast probing toward control of the
motion of electrons, ions and spins**

The terahertz (THz) frequency range is of central relevance from a fundamental scientific as well as from an application-related point of view. First, owing to its low photon energy (4.1 meV at 1 THz), THz radiation is an excellent probe of many elementary excitations of matter, for example rotations and vibrations of molecules, lattice vibrations (phonons) of solids, free electrons, the internal structure of excitons and spin waves. Second, bit rates in current information technology may soon approach the THz range. Therefore, it is warranted to study the behavior of materials at THz frequencies.

This talk is supposed to provide an introduction to THz spectroscopy in which ultrashort THz electromagnetic pulses (duration <1 ps) are used as ultrafast Ohmmeters and Amperemeters to gain insight into elementary motions of electrons, ions and spins in solids. Finally, examples are provided to show that extremely strong THz fields (\sim MV/cm) can even be used to push matter into novel states.

All interested persons are cordially invited.

Gez. Prof. Dr. Christoph Lienau, Prof. Dr. Niklas Nilius