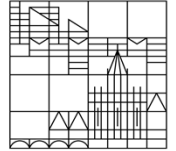


Physikalisches Kolloquium

Universität
Konstanz



Di. 19.06.2018
15:15 Uhr
14:45 Uhr, Kaffee/Tee
R 513



Antrittsvorlesung

Prof. Dr. Peter Baum
Universität Konstanz

Atoms and Electrons in Motion

All processes in the world around us are on a fundamental level defined by atomic and electronic motion from initial to final conformations. A movie-like visualization in space and time could reveal the fundamental mechanisms behind the abundant dynamical phenomena that are all around.

In this presentation, I report how we can actually see the atoms and electrons as they move in space and time. The necessary attosecond resolution in time (the optical cycle) and picometer resolution in space (the size of an atom) are achieved by pump-probe electron microscopy and diffraction with light-cycle-controlled single-electron wavepackets. The power of this approach is shown by reporting three visualization results: (a) electronic motion in a metamaterial, (b) atom trajectories during a phase transformation and (c) light-cycle dynamics across a nanostructure.

One of our next steps in Konstanz is the setup of 1-2 modern electron microscopes with our ultrafast metrology. This unique infrastructure will widen our space-time imaging capabilities towards even more complex, functional materials and nanostructures for next-generation photonics and electronics.

