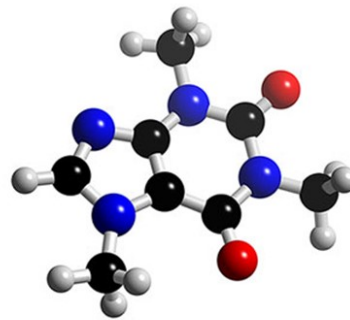
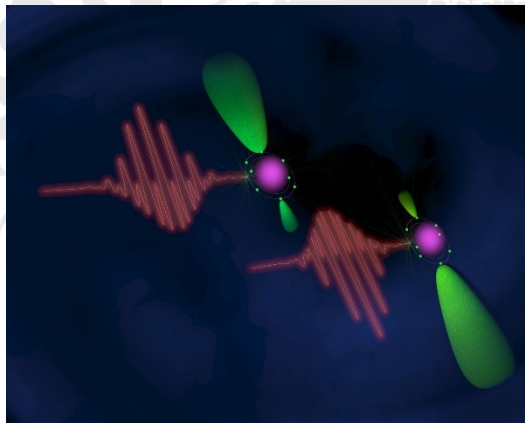


# PHYSIKALISCHES KOLLOQUIUM

## ANTRITTSVORLESUNG

AM 9. JANUAR 2017 UM 17 UHR C.T.

IM GROßEN HÖRSAAL



### ATTOSECOND AND INTENSE EXTREME ULTRAVIOLET PULSES: TWO COMPLEMENTARY TOOLS TO INVESTIGATE AND CONTROL ELECTRONIC DYNAMICS

PROF. DR. GIUSEPPE SANSONE

*PHYSIKALISCHES INSTITUT, UNIVERSITÄT FREIBURG*

The generation and characterization of trains and isolated attosecond ( $1\text{as} = 10^{-18}\text{ s}$ ) pulses have been achieved thanks to the continuous development of ultrafast intense laser sources and of our understanding of the process of high-order harmonic generation. Attosecond pulses are the shortest reproducible events produced so far and their duration is rapidly approaching the atomic unit of time ( $1\text{ a.u.} = 24\text{ as}$ ), which represents the natural timescale of the electronic motion inside the atom in the Bohr model. However, their applications in several spectroscopic techniques is extremely challenging, due to the low intensity.

On the other side, extreme ultraviolet laser pulses characterized by high intensities and femtosecond time duration are generated by a few Free Electron Lasers worldwide.

I will show how attosecond pulses can be used to excite and investigate ultrafast electronic and electron-nuclear dynamics in simple and complex molecules. Complementary to this research field, intense multi-color extreme ultraviolet pulses open new perspectives for the implementation of coherent techniques for the control and investigation of electronic dynamics.