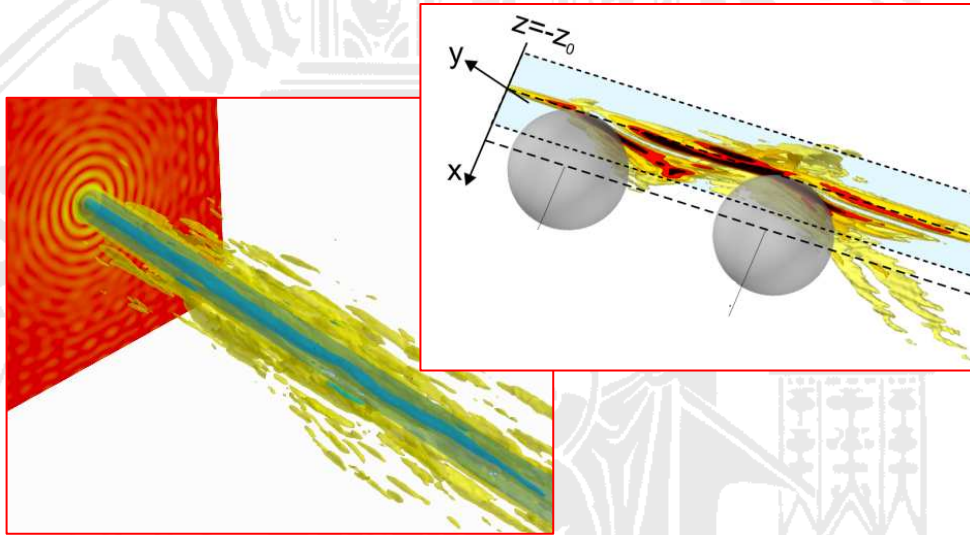


PHYSIKALISCHES KOLLOQUIUM

AM 28. NOVEMBER 2011 UM 17 UHR C.T.

IM GROßEN HÖRSAAL



ABOUT SELF-RECONSTRUCTING BEAMS AND UNCONVENTIONAL OPTICAL TRAPS

PROF. DR. ALEXANDER ROHRBACH

*LABORATORY FOR BIO- AND NANO-PHOTONICS,
DEPARTMENT OF MICROSYSTEMS ENGINEERING
UNIVERSITY OF FREIBURG, GERMANY*

Since the 1st presentation of a single beam optical trap about 25 years ago, plenty of variations of optical tweezers and three-dimensional optical potential landscapes have changed the world of micro- and nano-manipulation. In combination with advanced 3D tracking techniques, changes in position and orientation fluctuations can be measured precisely revealing forces, potentials or visco-elastic changes acting on molecules, organelles or cells. In this talk I will present latest results from the frontier of optical trapping and probe tracking affecting topics such as energy switching of single bacteria, hydrodynamic particle coupling and scanning probe microscopy.

Furthermore I will introduce the idea and recent developments of self-healing beams, which can self-reconstruct their initial beam profile even after massive phase disturbances by scatterers. By using computer holograms we can shape the angular momentum spectrum of these beams, enabling the realization of novel types of light microscopes.