

**Einladung  
zum  
Physikalischen Kolloquium  
Montag, 11.01.2016  
16:15 Uhr in N24/H13**

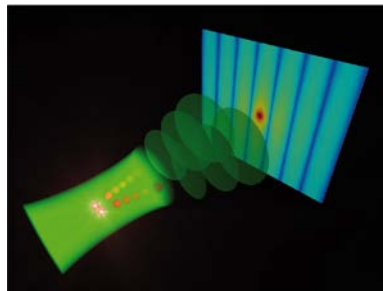


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**"Quantum optics at high energies and high frequencies"**

The field of laser-matter interaction traditionally deals with the response of atoms, molecules, and plasmas to an external light wave. However, the recent sustained technological progress is opening up the possibility of employing intense laser radiation to trigger or substantially influence physical processes beyond atomic-physics energy scales. Available optical laser intensities exceeding  $10^{20}$  W/cm<sup>2</sup> can push the fundamental light-electron interaction to the extreme limit where radiation-reaction effects dominate the electron dynamics, can shed light on the structure of the quantum vacuum, and can trigger the creation of particles such as electrons, muons, and pions and their corresponding antiparticles. Also, novel sources of intense coherent high-energy photons and laser-based particle colliders can pave the way to nuclear quantum optics and may even allow for the potential discovery of new particles beyond the standard model. After an overview into this regime, the focus of the talk will be placed on resonant interactions of highly charged ions and nuclei with super-intense free-electron lasers or high-frequency photons from laser-accelerated particles.



Ab 16.00 Kaffee, Tee und Kekse vor dem Hörsaal H13

**Organisation: Prof. Dr. F. Jelezko, Tel. 23750**

**Host: Prof. Dr. M. Plenio, Tel. 22900, off.: 22911**