

VORTRAGSANKÜNDIGUNG

MPQ – SONDERSEMINAR



Am Dienstag, dem 25. März 2014 um 13:30h

Spricht Craig Benko

JILA, University of Boulder at Colorado

über „Extreme Ultraviolet Radiation with Coherence
Time beyond 1 s”

Herbert-Walther Hörsaal des MPI für Quantenoptik, Garching

gez. Dr. Dylan Yost

Extreme Ultraviolet Radiation with Coherence Time beyond 1 s

Craig Benko

*JILA, 440 UCB
Boulder, CO 80309-0440*

Abstract

Many atomic and molecular systems of fundamental interest possess resonance frequencies in the extreme ultraviolet (XUV), where laser technology is limited and radiation sources have traditionally lacked long-term phase coherence. Recent breakthroughs in XUV frequency comb technology have demonstrated spectroscopy with resolution at the MHz-level but even higher resolutions are desired for future applications in precision measurement. By characterizing heterodyne beats between two XUV comb sources, we demonstrate the capability for sub-Hz spectral resolution. This corresponds to coherence times > 1 s, at photon energies up to 20 eV, more than 6 orders of magnitude longer than previously reported. We also identify various noise contributions to the obtainable comb linewidth in the XUV. This work establishes the ability of creating highly phase stable radiation in the XUV with performance rivaling that of visible light. Further, by direct sampling of the phases of the XUV light originating from high harmonic generation, we demonstrate precise measurements of attosecond strong-field physics.