CFEL SCIENCE

SEMINAR

11th April 2013 – 10:00 a.m.
CFEL-bldg. 99, seminar room I and II (EG.076/078)

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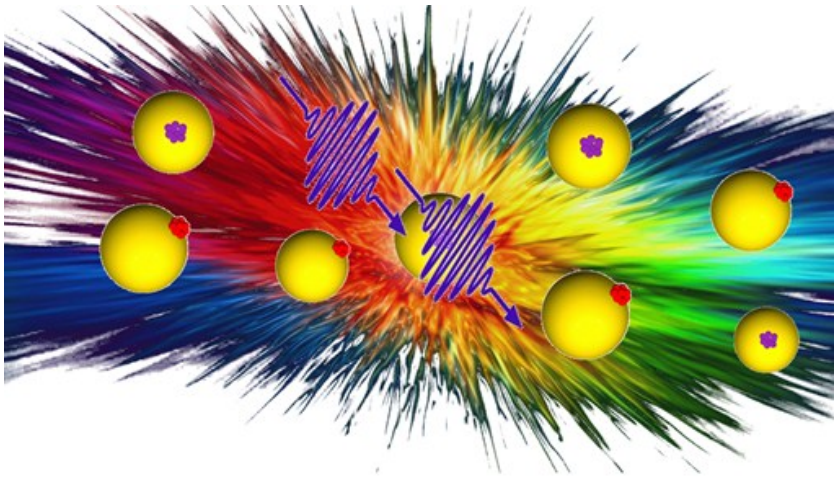
Rare gas clusters in intense laser fields from IR to XUV

With upcoming new laser sources providing intense radiation all the way up to the x-ray regime, the understanding of excitation, ionization and plasma formation processes have gained much interest. Rare gas clusters have been used right from the beginning as excellent model systems for laser matter interaction. Because of their simple electronic structure we studied helium clusters irradiated by intense laser fields from the IR to the XUV. Upon IR excitation a nanoplasma formation is strongly determined by the presence of dopant atoms or molecules and takes place at sub 10 fs times [1]. We found a crucial dependence of the ionization and plasma formation on the location of the dopants. At the free electron laser FERMI@ELETTRA nanoplasma formation in helium droplets has been studied with XUV pulses. Despite the much lower ponderomotive energy-efficient ionization can be achieved when tuning the laser to helium resonance photon energies. At high intensities interatomic coulombic decay (ICD) processes appear to dominate the helium ionization.



[1] S.R. Krishnan, C. Peltz, L. Fechner, V. Sharma, M. Kremer, B. Fischer, N. Camus, T. Pfeifer, J. Jha, M. Krishnamurthy, C.D. Schröter, J. Ullrich, F. Stienkemeier, R. Moshammer, T. Fennel, M. Mudrich, New J. Phys. 14, 075016 (2012).

Host: Terence Mullins, CFEL Molecular Physics Seminar