



**24<sup>th</sup> January 2019 - 10:00 h**

**CFEL – Building 99, seminar room I+II (ground floor)**

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### **HHG and applications: from scattering of large particles to transient absorption in liquids**

When an electron is released from an atom or a molecule by strong field ionization, the interplay between the free-electron and the laser field can lead to elastic and inelastic recollision with the parent ion left behind, a process that is responsible of a plethora of phenomena ranging from high harmonic generation, non-sequential ionization and laser-induced electron holography and diffraction. High harmonic generation is a processes that allows the generation of ultrashort burst of XUV and X-ray light reaching the attosecond domain that can be used in combination with pump-probe techniques to directly trigger and/or monitor elementary processes in atoms and molecules with an unprecedented time resolution.

One limitation of the high harmonic generation process is its relatively low conversion efficiency. In my talk, I will discuss the recent progress to generate relatively intense XUV and soft X-ray pulses by means of HHG at the Max Born Institute and some of their applications in understanding the ionization dynamis of rare-gas clusters in intense XUV pulses, including our recent effort to perform single-shot, coherent diffractive imaging studies of individual nanoparticles. We will also present our recent attempt to generate broadband soft X-ray pulses in the water window spectral range, i.e. between 280 eV and 540 eV, to perform soft X-ray absorption spectroscopy experiments of molecules in solution.