

Ludwig-Maximilian Universität München / Max-Planck Institut für Quantenoptik

MSc project
“Spectral and temporal characterization of XUV pulses from nanostructured waveguides”

A MSc project is available within the “Attosecond Imaging” Max-Planck Research Group that is affiliated with the “Laboratory for Attosecond and High-field Physics (LAP)” of Prof. Ferenc Krausz. The MSc project will be carried out in our LMU laboratory (Coulombwall 1, 85748 Garching).

Background: Laser-driven high harmonic generation (HHG) is a well-established technique for the production of attosecond pulses in the extreme-ultraviolet (XUV). Due to the high intensities required, these XUV sources rely upon chirped pulse amplification systems with typical pulse repetition rates of a few kHz, limiting their application potential. This project aims at extending this capability in developing coherent sources of (isolated) sub-femtosecond XUV pulses at MHz repetition rates. We aim to spectrally and temporally characterize XUV pulses, which are generated at MHz repetition rate using nanostructured waveguides. The field enhancement within the waveguide enables high harmonic generation at external laser intensities that are available with Ti:sapphire oscillator systems. MHz (attosecond) XUV light sources will open up new applications in time-resolved spectroscopic studies, biomedical imaging, nanoplasmonics as well as XUV holography and lithography.

The task: The student will carry out experiments on an existing laser and vacuum setup for the generation of MHz XUV pulses and in particular characterize the XUV light spectrally and temporally. The aim of the project is to identify nanostructured waveguides, which are produced by external partners, and enable the generation of single attosecond light pulses for the first time.

Qualification: We are seeking for enthusiastic and highly motivated candidates with an interest in ultrafast laser physics and nanooptics. Excellent experimental skills are required. Previous research laboratory experience will be viewed positively. Good skills in written and spoken English are expected.

An application, to be sent by email to Prof. Matthias Kling, should include a short CV and electronic copies of the high-school and university grades.

Contact:

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References:

<http://www.attoworld.de/kling-group/>