Max-Planck-Institut für Struktur und Dynamik der Materie

Max Planck Institute for the Structure and Dynamics of Matter

MPRS UFAST Call for PhD applications 2024/2025

FK2- Attosecond Science with Sub-cycle Pulses

Title of PhD Project	Attosecond Science with Sub-cycle Pulses
Type	Experimental
Supervisor(s)	Prof. Franz X. Kärtner
Affiliation(s):	DESY
Number of positions:	1
Abstract:	We have developed an optical sub-cycle parametric waveform synthesizer in the near infrared that enables direct generation of isolated attosecond pulses covering the XUV to water window wavelength range. In this project, we expand this setup to an attosecond transient absorption spectroscopy tool to investigate the attosecond electron dynamics of important chemical processes related to energy conversion, catalysis and water radiolysis. We seek candidates with strong background/experience in ultrafast nonlinear optics, atomic, molecular physics; experience in attosecond science, vacuum technology, programming/numerical skills (Matlab, C++, Python, LabView) are highly advantageous. The successful candidate should be self-motivated and will work in a team with other PhD students and postdocs in a first-class scientific environment on cutting-edge topics at the current frontiers of laser technology and extreme light-matter interactions. Research is performed within international collaborations, e.g., with groups at MIT, Politecnico Milano and University of Hamburg. G. M. Rossi et al., "Sub-cycle millijoule-level parametric waveform synthesizer for attosecond science," Nature Photonics 2020, https://doi.org/10.1038/s41566-020-0659-0. Y. Yang et al., "Strong-field Coherent Control of Isolated Attosecond Pulse Generation," Nat. Communications 12, 6641 (2021). https://doi.org/10.1038/s41467-021-26772-0.
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