



Invitation to Seminar Talk

Taming light waves: Attosecond triggering and clocking of electronic processes

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Real-time control of electrons in the microcosm calls for electromagnetic forces confinable and tunable over sub-femtosecond time intervals. I will discuss how recent progress in lightwave technologies [1-5] has enabled important steps towards this essential milestone in science and technology. With novel types of light synthesizers that manipulate ultrawideband coherent light sources, spanning the visible and flanking spectral ranges, it is now possible to sculpt [4] and trace [1] the waveform of light with subcyclic precision opening up the root to attosecond photonics.

To explore the potential of the new tools for advancing microscopic manipulation of matter, we have used synthesized light transients to demonstrate basic elements of sub-femtosecond control of electrons such as attosecond triggering and clocking of their dynamics in the valence shell of atoms [5], [6] and their real-time tracing [5].

[1] E. Goulielmakis et al., Science 305, 1267 (2004).

[2] E. Goulielmakis et al., Science 320, 1614 (2008).

[3] E. Goulielmakis et al., Science 317, 769 (2007).

[4] A. Wirth et al., Science 334,195 (2011).

[5] M. Th. Hassan et al., Rev. Sci. Instrum. 83,111301 (2012).

[5] E. Goulielmakis et al., Nature 466, 739 (2010).

[6] M. Th. Hassan et al., in preparation (2013).

Tuesday, February 5, 2013, 9.45 am

Seminar Room Mondi 2, Central building, 1st floor

This invitation is valid as a ticket for the IST Shuttle from and to Heiligenstadt Station. Please find a schedule of the IST Shuttle on our webpage (note that the IST Shuttle times are highlighted in dark green): http://www.ist.ac.at/fileadmin/user_upload/pdfs/IST_shuttle_2011.pdf.

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