ICFO Colloquium FERNANDO MARTIN 'XUV/X-Ray Femto- and Attosecond Laser Pulses for Ultrafast Electronic Control in Chemistry'

FERNANDO MARTIN

May 06, 2013

Monday, May 6, 2013, 12:00. ICFO?s Auditorium

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The development of attosecond laser pulses allows one to probe the inner working of atoms, molecules and surfaces on the timescale of the electronic response. In molecules, attosecond pump-probe spectroscopy enables investigations of the prompt charge redistribution and localization that accompany photo-excitation processes, where a molecule

is lifted from the ground Born-Oppenheimer potential energy surface to one or more excited surfaces, and where subsequent photochemistry evolves on femtosecond timescales. In this talk I will present a few theoretical examples of realistic molecular attosecond pump-probe experiments in which simple molecules are ionized with a single attosecond pulse (or a train of attosecond pulses) and are subsequently probed by one or several infrared or xuv few-cycle pulses. The localization of the electronic charge distribution within the remaining molecular ion is calculated with attosecond time-resolution and is visualized by varying the delay between the pump and probe pulses. The results of these calculations [1-3] are compared with recent experimental measurements and provide the different mechanisms that are responsible for the observations.

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Hosted by Prof. Jens Biegert