“ Extreme Nonlinearity: Attosecond-Angstrom Science ”

Séminaire général du Département de Physique de l'École Polytechnique

Paul B. Corkum

Joint Laboratory for Attosecond Science, University of Ottawa and National Research Council of Canada

Attosecond methods represent a discontinuity in optical technology the scale of which can be appreciated from the fact that the minimum pulse duration has fallen by more than a factor of 50 during the past 6 years. These advances have occurred because high-order nonlinearities allow us to work below the period (and wavelength) of light.

It is possible to think of the current generation of attosecond technology in interferometric terms. In the electric field of an intense light pulse, an electron is split by sub-cycle tunneling. One component of the electron wavefunction is accelerated away from the ion by the field and then returns after the field reverses sign. The other component remains bound. When they re-collide, the two components interfere, creating an attosecond pulse.

Interferometry allows the interfering waves to be re-constructed; their spatial, temporal and spectral properties. Consequently attosecond pulses contain the information needed to measure the electron wavefunction of the atom or molecule from which it was produced. In this presentation you will learn how attosecond pulses are produced and measured. You will also be introduced to three new highly-nonlinear methods of molecular spectroscopy.

9 janvier 2009

ÉCOLE POLYTECHNIQUE
Amphithéâtre Arago
14 h 00

http://loa.ensta.free.fr/SeminairesX/