Two-electron atomic response on the attosecond time-scale

KENNETH TAYLOR, DAMTP, The Queen’s University of Belfast

Over the past decade or so we have developed methods [1] that now allow accurate two-electron solutions of the full-dimensionality Time-dependent Schroedinger equation to be constructed and temporally followed as they evolve on the attosecond time-scale. A survey of the achievements of this work will be presented. These range from the prediction of Double Above Threshold Ionisation [2] brought about by intense light in the EUV; through the prediction of uni-lateral double ionization by longer wavelength light [3] to the prediction of a surprising energy-partition between the two electrons ionizing as a result of a recollision process at Ti:sapphire wavelengths [4]. The talk will go on to describe new theoretical investigations pertinent to the imminently-available XFEL sources and also to FEL and IR lasers in combination.

References:

1Supported by the UK Engineering and Physical Sciences Research Council and the Department of Employment and Learning Northern Ireland.