High Harmonic Generation: An ultrafast coherent source

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High harmonic generation (HHG) in gases driven by intense, femtsoecond laser pulses provides a very promising source of coherent short wavelength radiation in the 5-100nm range. High harmonic radiation is the result of coherent "recollisions" of a laser driven electron wavepacket with its parent atomic core. A unique feature of this light is its very short pulse nature (down to ~0.1fs = 100 as) and its precise synchronisation with the driving laser pulse. This allows it to be used in pump-probe type studies (typically XUV+IR) to track ultrafast dynamics. A less-well known feature of HHG is that the electron recollision event can be used to *image* molecular structure and dynamics on the attosecond timescale and sub-Angstrom length scale.

This talk will review the production of HHG light as a coherent source for imaging and discuss some of the exciting developments in recent years on attosecond timescale dynamic measurements.