

PHYSICS AND ASTRONOMY COLLOQUIUM

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Tracing Attosecond Electron Dynamics with Ultrashort Laser Pulses

In the past time-resolved experiments and theoretical analysis explored molecular rotation and vibration as well as chemical reactions on the time scale of atomic motion. Recent advances in laser science led to the development of attosecond laser pulses (1 atomic unit = 24 attoseconds) which can uncover new insights in the inner dynamics of atoms and molecules on the natural time scale of electronic dynamics. In my talk I will present physical concepts behind attosecond laser pulse technology and measurement techniques to uncover electron dynamics. In particular, I will discuss our recent theoretical efforts to understand the generation of bright attosecond soft X-ray pulses using midinfrared lasers and to use the attosecond streaking camera technique to observe time delays on photoionization.



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