

### Plenary Talk

PV VI Wed 9:45 E 415

**Imaging attosecond multi-electron dynamics** — ●MISHA IVANOV  
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I will cover several topics related to our work on trying to follow and understand multi-electron dynamics in atoms and molecules, triggered by one-photon or multi-photon ionization. First, I will touch upon the question of how long does it take to remove an electron from an atom or a molecule by light. I will focus on the role of electron-electron interaction in introducing time-delays in this process. Using an example of an excited Helium atom, I will describe a very simple physical picture of how electron-electron interaction can delay one-photon ionization.

Second, I will explain why it may take much less time to absorb many photons than one. Multi-photon absorption in strong laser fields is often viewed as tunnelling. I will discuss our recent results on the role of electron-electron correlation during laser-induced tunnelling, and how these effects manifest themselves in photo-electron or high harmonic spectra.

Third, I will discuss applications of high harmonic spectroscopy to tracking core rearrangement dynamics induced by one-photon ionization, including high harmonic spectroscopy of the Auger-like processes. Finally, I will show how strong laser fields can control the hole dynamics on a femtosecond time-scale, and how this control manifests itself in the high harmonic response.