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Molecular movies in colour! Coulomb imaging with table top femtosecond laser pulses.

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One of the primary objectives of science is to extend our senses to the smallest realms and to observe processes which occur on the fastest time scales. Coulomb explosion imaging using femtosecond, few cycle, laser pulses has been able to make measurements of the structure of small molecules on the angstrom length scale and observe their dynamics on the timescale of a few femtoseconds. Recently, a team from University of Waterloo and INRS working at the Advanced Laser Light Source have employed increasingly ambitious pulse control and wavelength selection, to control and image dynamics with new levels of accuracy.

I will give an introduction to the imaging methods used, for non specialists and put our recent results into the context of worldwide efforts. I hope to show that the tabletop femtosecond laser approach has several distinct advantages, over other methods, and that if it continues to develop, by incorporating, the best aspects of complementary approaches, it can continue to set the standard for the near future.

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