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Mega-Electronvolt Ultrafast Electron Diffraction at SLAC

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Electron diffraction has been a staple technique for determining the structure of countless molecules for nearly a century [1]. However, it has only been in the last couple of decades that we have been able to use this technique to obtain time-resolved images of molecules undergoing light-induced chemical processes. Whilst numerous ultrafast electron diffraction (UED) experiments have been carried out [2-4], the experiments carried out at the ASTA Facility at SLAC are at the forefront of this technique [5].

In this poster we will discuss the results from several of the SLAC UED initiative experiments, including:

- The laser-induced rotational wavepacket of N₂ – the first UED experiment to simultaneously obtain sub-500 femtosecond time-resolution and sub-Ångstrom spatial resolution [6].
- The observation of the laser-induced vibrational wavepacket of I₂ [7].
- The recent investigation into the ring-opening process of Stilbene Oxide.

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