CFEL SCIENCE

SEMINAR

5th April 2018 - 10:00 h

CFEL – Building 99, seminar room I+II (ground floor)

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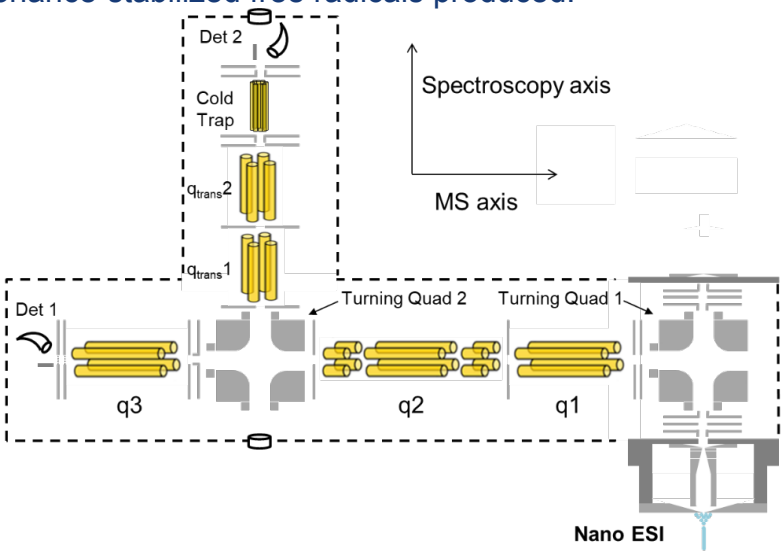
Single-Conformation Spectroscopy from the Microwave to the Ultraviolet

There are many applications of molecular spectroscopy in which the molecules under interrogation form a complex mixture, and therefore the spectra they produce have transitions from the various components interspersed with one another, making identification and assignment challenging. This talk will describe the methods used in our group at Purdue to carry out single-conformation spectroscopy of large molecules capable of folding into a number of different conformational isomers, each with unique spectroscopic signatures. Using laser desorption of neutral molecules or electrospray ionization of ions, we bring molecules into the gas phase and cool them (via a supersonic expansion or buffer cooling) down to temperatures near absolute zero. Interrogation occurs via double- or multiple-resonance spectroscopy, to obtain single-conformation spectra in the infrared, ultraviolet, or (most recently) the microwave. This talk will begin by describing some of our recent IR/UV results on peptides and synthetic foldamers, and conclude with recent results using strong-field coherence breaking in the microwave region to identify sets of rotational transitions due to one component of a mixture. Application in the microwave region will be made to the pyrolysis of biofuels and the resonance-stabilized free radicals produced.



Multi-stage Mass Spectrometer for Single-conformation Spectroscopy of Cryocooled Ions

Host: Terry Mullins / CFEL Molecular Physics Seminar