CFEL SCIENCE

SEMINAR

24th October 2024 - 10:00 h

CFEL – Building 99, seminar room I & II (Groundfloor)

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Pushing nonlinear spectroscopy and coherent control towards highly dilute samples and the extreme ultraviolet spectral domain

We develop nonlinear spectroscopy and coherent control techniques in the gas phase at visible wavelengths and push boundaries towards applications in the extreme ultraviolet (XUV) spectral domain. In the first part of my talk, I will report about high-resolution two-dimensional spectroscopy in the gas phase to study the structure and ultrafast dynamics of molecular nanosystems isolated from environmental perturbations. To generate the nanoconfined systems, atomic clusters are doped with individual molecules in an ultrahigh vacuum environment (Fig. 1a). The available systems range from single molecules, to small molecular complexes and molecules solvated in a tunable environment (Fig. 1b). We will highlight some of the method development involved in this experimental approach and recent applications. In the second part of my talk, I will introduce our methods for coherent manipulation of XUV pulses and the quantum control of strong-field processes in He atoms.

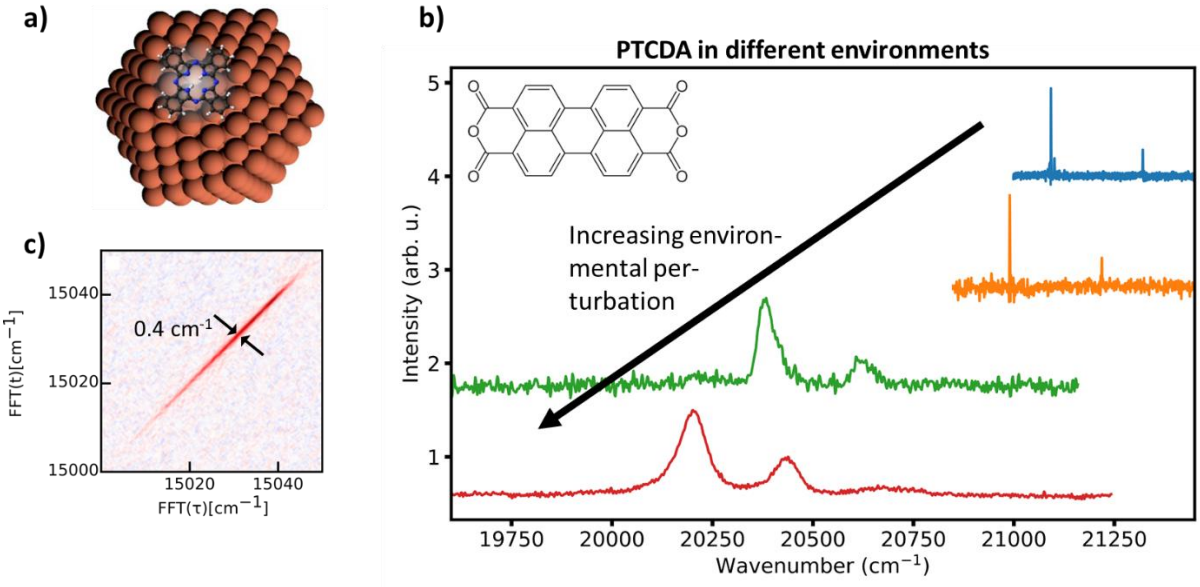

Fig. 1 (a) Illustration of a doped cluster. (b) Perylenetetracarboxylic dianhydride (PTCDA) solvated in different cluster environments. (c) High-resolution 2D spectrum of phthalocyanine doped on argon clusters resolving the homogeneous line profile caused by molecule-phonon interaction.

Host: Andrea Trabattoni, DESY, CFEL, FS-ATTO Group