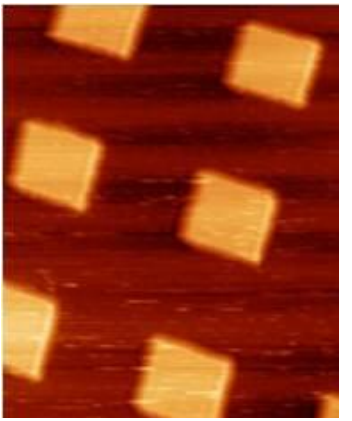
O5 (program reference number)
Femtosecond Time-Resolved Nonlinear Spectroscopy for the Investigation of Dynamics of Nanostructures

Arnulf Materny, M. Namboodiri, T. Khan, M. Kazemi, P. Donfack
Jacobs University Bremen, 28759 Bremen, Germany

Recently, we have reported about the successful combination of femtosecond time-resolved nonlinear pump-probe and CARS spectroscopy and scanning near-field optical microscopy allowing for nanometer spatial resolution. Here, we present the application of this technique to organic semiconductor – gold contact interfaces. Only with high spatial resolution reliable data on the ultrafast exciton dynamics with well-defined population densities can be obtained. We find that the exciton relaxation dynamics is considerably faster in the nanometer proximity of the semiconductor gold interfaces, pointing to the strong coupling at the interface.



In a second project, we have studied the ultrafast dynamics of iodine molecules embedded in the supramolecular cages of cucurbit[6]uril (CB6). Earlier investigations using Raman spectroscopy in the frequency domain have pointed to the formation of a new phase of matter, in which an unprecedented fast motion of iodine inside CB6 has to be assumed, which is not comparable to gas phase or any other medium. In order to study the dynamics also in time domain, different femtosecond time-resolved nonlinear experiments have been performed. First results will be presented.

This space will be reserved for notes and will take up the lowest part of the page.