Julius-Maximilians-
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Kolloquium der Physikalischen &
Theoretischen Chemie
und FOR 1809

Dienstag, 10.07.2018 **Hörsaal D, Chemiezentralgebäude, 17:15 Uhr**

Sprecher: **Thomas Feurer**

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Titel: **Manipulating Long-Range Energy Transfer Via Intense THz Fields**

Abstract:

Intense THz fields have the potential to drive nonlinear effects in matter. Several examples have been demonstrated in the past and here we address the question whether THz fields can also influence intra-molecular electron transfer processes. In this presentation I will summarize the current status of this long term enterprise, starting with a short introduction to THz science, presenting a selection of nonlinear THz light matter interactions and finally introducing our molecular systems of interest.

The systems we investigate is a novel family of DNA-hosted multi-chromophore light harvesting compounds. In these assemblies, light harvesting units are constituted by phenanthrene molecules stacked in a helix-like structure. The acceptor unit is pyrene which is introduced at a specific location with respect to the donors. These aromatic chromophores give rise to pi-stacking and strong coupling between chromophores and they feature gigantic absorption cross-sections (10 to 10'000 times higher than any visible dye). These systems show unitary energy transfer quantum yield over tens of nm and a marked dependence on the nature of the light harvester and small chemical modifications. These assemblies provide the capability of arranging acceptors and donors in well-defined positions, allowing for different types of energy transfer and systems with variable bridge length between light harvesting units. Therefore, these systems are ideal to study the link between energy transfer and structure, specifically inter-chromophore distances. Via dedicated time-resolved experiments and computational studies, we characterize the photo-cycle of isolated monomer units and arrays of stacked phenanthrenes units, with and without acceptor. We unravel the origin of the efficient long-range energy transfer and provide a conclusive model.

Organisation: Prof. Dr. Tobias Brixner

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