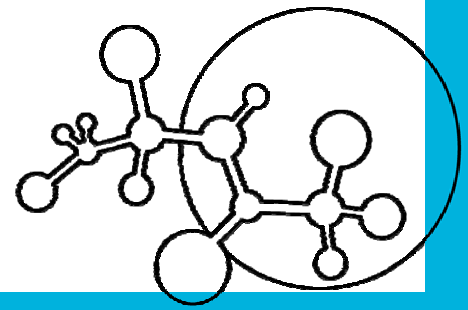




FRIAS

FREIBURG INSTITUTE FOR ADVANCED STUDIES
ALBERT -LUDWIGS -UNIVERSITÄT FREIBURG
SCHOOL OF SOFT MATTER RESEARCH



Quantum Efficiency Seminar and Colloquium

Jasper Knoester

Zernike Institute for Advanced Materials,
University of Groningen, The Netherlands

Spectroscopy of complex molecular systems: Physics on an exciton cake-walk

The concept of excitons, collective excited states, is well-known in solid-state physics. It was first developed by Frenkel in the 1930's to explain the absorption spectrum of perfect molecular crystals, in which case the excitons are simple Bloch waves of excitation. Over the years, it has become apparent that also less regular structures carry delocalized excitons, which are responsible for many of their electromagnetic properties and energy transport characteristics. In this presentation, I will address two classes of such systems. The first class are molecular J-aggregates, large self-assembled structures containing up to 1000's of molecules, which play a role in opto-electronic applications and natural photosynthetic systems. The second class are polypeptides and proteins, in which case collective vibrations are the excitations of interest. The irregular nature of these systems and the occurrence of fluctuations in their host, provide a complex and dynamic landscape in which the excitons are created, evolve, and decay. I will address the basic physics of these systems, some of their intriguing properties, and discuss how (ultrafast) spectroscopies are used to detect such properties.

Date: Tuesday, February 8th, 2011 4:15 pm

Location: FRIAS Seminar Room, Albertstr. 19, Freiburg

Contact: Andreas Buchleitner, Institute of Physics, Quantum Optics and Statistics,
T +49 761 203 5929 F +49 761 203 5967 E beate.spingler@frias.uni-freiburg.de
www.physik.uni-freiburg.de

Physikalisches Institut

Albert-Ludwigs-
Universität Freiburg

