Graduate School Seminar

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INSTITUT FÜR PHYSIK

Talks in WS 2017/2018

Traditio et Innovatio

Universität Rostock

02nd November 2017, **15:00**

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AG Molecular Quantum Dynamics

Excitonic Coupling and Excitation Energy Transfer in the LH2 Complex of Allochromatium Vinosum

Bacterial photosynthesis is one of the most adaptable and robust energy harvesting processes in nature, with light-harvesting complexes playing a crucial role [1]. The peripheral light-harvesting complex (LH2) of the purple bacterium *Allochromatium vinosum* is particularly distinct as it shows a double peak structure in the B800 absorption band [2]. Two hypotheses concerning the origin of this splitting have been
proposed; either two distinct B800 bacteriochlorophyll site energies [3], or an excitonic dimerization of bacteriochlorophylls within the B800 ring [4].

First, I will give a brief overview on bacterial photosynthesis and how to investigate its primary steps using time-resolved spectroscopy. Second, I will address the origin of the peak splitting in the LH2 complex of *Allochromatium vinosum* through the use of two-dimensional electronic spectroscopy and present unambiguous evidence that the peak splitting is due to excitonic dimerization. Furthermore, I will introduce an approach to identify and characterize all energy transfer pathways within the complex by using a refined global fitting procedure [5].

[1] R. J. Cogdell et al., Quarterly Reviews of Biophysics **39**, 227 (2006)
[2] A. Carey et al., Biochemica et Biophysica Acta **1837**, 1849 (2014)
[3] D. M. Niedzwiedzki et al., Biochimica et Biophysica Acta **1817**, 1576 (2012)
[4] A. Löhner et al., Photosynthetic Research **123**, 23 (2015)
[5] J. Dostal et al., The Journal of Chemical Physics **145**, 124312 (2016)

Talk: English
Slides: English

Location: Institute of Physics, Albert-Einstein-Str. 24, HS1