

Einladung
zum
Physikalischen Kolloquium
Montag, 15.05.2017
16:15 Uhr in N24/H13



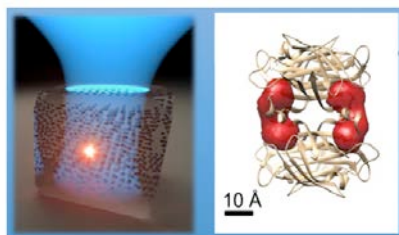
Professor Dr. Vahid Sandoghdar
Max Planck Institute for the Science of
Light
Erlangen

Experiments with Single Molecules: *From quantum optics to structure biology*

I plan to start this presentation with an overview of our work over the past decade on the efficient coupling of light and single quantum emitters. Some examples of the recent achievements include single-photon communication of two individual molecules at long distances [1], coherent nonlinear optical interactions, where a single organic molecule act as an efficient switch for weak beams of light [2] and coherent coupling of a single molecule to a mode of a microcavity [3]. The long-term goal of these projects is to establish a platform for nano- quantum-optical operations and cooperative interactions in a mesoscopic system of photons and quantum emitters [4-6]. In the second part of the talk, I will show how cryogenic single molecule microscopy and spectroscopy can provide the highest resolution in optical microscopy [7, 8], reaching three-dimensional Angstrom resolution in studying proteins.

References:

- [1] Y. Rezus, et al., *Phys. Rev. Lett.* **108**, 093601 (2012).
- [2] A. Maser, et al., *Nature Photonics* **10**, 450 (2016).
- [3] D. Wang, et al., *Phys. Rev. X*, to appear; arXiv:1612.05007
- [4] S. Faez, et al., *Phys. Rev. Lett.* **113**, 213601 (2014).
- [5] H. Haakh, et al., *Phys. Rev. A*, **94**, 053840 (2016).
- [6] P. Türschmann, et al., *submitted*; arXiv:1702.05923
- [7] C. Hettich, et al., *Science* **298**, 385 (2002).
- [8] S. Weisenburger, et al., *Nature Methods* **14**, 141 (2017).



Ab 16.00 Uhr Kaffee, Tee und Kekse vor dem Hörsaal H13

Organisation: Prof. Dr. F. Jelezko, Tel. 23750

Host: Prof. Dr. J. Michaelis, Tel. 23050, off.: 23051