

**Physikalisch-Chemisches Kolloquium am Montag, den 11.01.2016  
um 17:00 (AR-F002)**

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Titel: *Coordinate-targeted fluorescence nanoscopy with multiple off-states transitions*

**Abstract**

Far-field fluorescence nanoscopy techniques like STED or STORM are revolutionizing the way, how we see life being organized on the nanoscale[1]. These methods break the diffraction barrier, which determines the best-attainable resolution of conventional fluorescence microscopes, by switching fluorescent molecules between an emitting (“on”) and a non-emitting (“off”) state. Here, we introduce a novel general concept, which makes use of multiple off-state transitions (MOST) for coordinate-targeted fluorescence nanoscopy. We realize the concept in the form of Protected STED by harnessing the non-emitting configuration of reversibly-switchable fluorescent proteins[2] as second off-state. We show that the combinatorial transfer to two off-states results in improved resolution, higher image contrast and fluorophore protection against photobleaching. The great imaging capability of the method is demonstrated for various living samples, e.g. neurons in hippocampal brain slices.

[1] Huang, B., Babcock, H. & Zhuang, X. Cell 143, 1047-1058 (2010).

[2] Zhou, X. X. and Lin, M. Z. (2013) Current Opinion in Chemical Biology 17(4), 682–690.