

# ANSWERING BIOLOGICAL QUESTIONS BEYOND THE ABBE LIMIT - THE LEICA TCS STED

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The groundbreaking concept of stimulated emission depletion (STED), invented by Prof. Stefan Hell [1], has allowed elevating light microscopy beyond established limits. It has resulted in answering many biological questions [2,3,4,5], already, although the access to this complex technology has been restricted to a limited group of experienced researchers, so far. Leica Microsystems has developed a fully integrated super resolution system for the daily research –

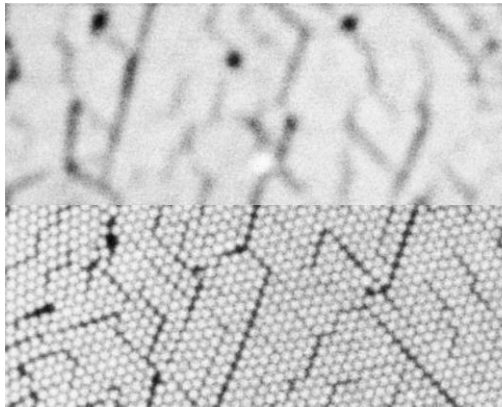


Fig. 1: Layer of fluorescent nanoparticles imaged under confocal (upper lane) and STED conditions

based on the confocal platform TCS SP5. The technical realization of the Leica TCS STED is presented, accompanied by details about the hard- and software integration of the STED module and its components. An introduction into the workflow will be given. No compromise has been made on the flexibility of the TCS SP5 giving access to e.g. multicolor recordings in combination with STED imaging and the full capability of optical sectioning to generate 3D data sets.

Quasi video rate STED imaging is demonstrated to underline the usability of STED even for fast imaging. Methods to perform live cell microscopy based on STED are discussed. Examples from different field of applications are presented, such as physiology, neuroscience and others to show the usability for many different fields of research.

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