SHARPER IMAGES AT LOWER POWER:
Gated STED: The Next Milestone in Confocal Super-Resolution

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Leica Microsystems now presents the next milestone in confocal super-resolution.
Leica gated STED is an option for STED CW based on Leica Microsystems NEW highly versatile core confocal: The **Leica TCS SP8**.

Stimulated emission depletion (STED) microscopy [1] provides fast and easy access to resolutions far beyond the Abbe limit. Gated STED is a new further development of STED microscopy [2]. It combines STED with CW lasers and time gated detection and this way increases resolution as well as photo stability significantly.

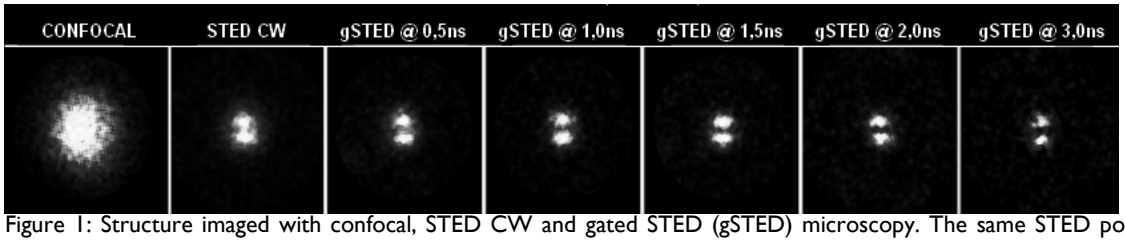

Figure 1: Structure imaged with confocal, STED CW and gated STED (gSTED) microscopy. The same STED power was applied for all STED images. Please note: The STED laser was not used at maximum power.

During the last few years, STED microscopy has proven to be an excellent super-resolution technology to study nanostructures inside cells and tissues and has generated spectacular results.

STED CW provides easy and intuitive access to dual color super-resolution as well as live cell imaging. It realizes confocal nanoscopy in the visible and allows choosing from a big set of fluorophores. Green standard dyes like Alexa 488, FITC, Oregon Green 488 can be applied with the same ease as fluorescent proteins like eYFP, Venus and Citrin and many more.

Gated STED keeps all this advantages and **resolves details smaller than 50nm**. Further gated STED enables to acquire more images and drives **live cell super-resolution studies to the next level**. Impressive results have been obtained even with eGFP.

In this workshop, the principles of gated STED imaging along with the commercial implementation are presented. An overview of the application portfolio ranging from super-resolution imaging inside live cell to colocalization studies at the nanoscale will be given.

[1] S.W. Hell SW, J. Wichmann, "Breaking the diffraction resolution limit by stimulated emission: stimulated-emission-depletion fluorescence microscopy", *Opt Lett.,* **19**, 780-2 (1994).
[2] G. Vicidomini , G. Moneron, K.Y. Han, V. Westphal , H. Ta, M. Reuss, J. Engelhardt, C. Eggeling, S.W. Hell, "Sharper low-power STED nanoscopy by time gating", *Nat Methods*, **8(7)**, 571-3 (2011).

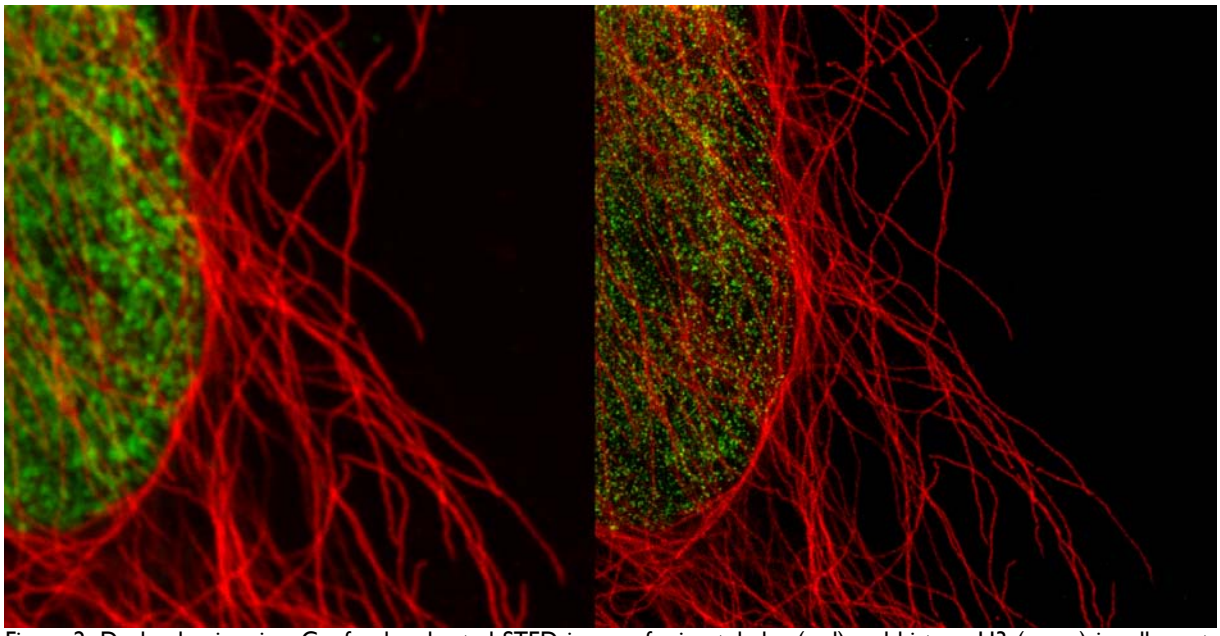

Figure 2: Dual color imaging: Confocal and gated STED image of microtubules (red) and histone H3 (green) in adherent cells.