The next dimension for STED microscopy: 3D STED over the full spectrum
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STED (STimulated Emission Depletion) microscopy [1] provides fast, intuitive, and purely optical access to study subcellular architecture and dynamics at the nanoscale. STED super-resolution meets the requirements of daily research and enables to discover minute details with live cell imaging capabilities. STED technology allows to engineer the PSF to the scientific needs not only in two but three dimensions and is possible all over the spectrum of visible light. Two STED light paths, multiple STED lasers, a white light laser as excitation source for pulsed, gated [2] and STED CW together with a newly developed STED objective constitute a new modular and highly flexible platform for confocal super-resolution.

This talk will outline the principles of multicolor as well as 3D STED together with their brand-new commercial implementation. Application examples from several fields will be presented ranging from triple color STED over 3D reconstruction of nuclear structures to live cell super-resolution imaging.

Figure 1: Comparison of effective PSFs of confocal and STED microscopy with STED light distributed to vortex and z donut path at different ratios. The PSF becomes tunable in xy and z. Simulated data.
