

## Abberior Instruments STED

Fluorescence inverted confocal microscope and STED super-resolution nanoscope with high detection efficiency of far-red photons. The system is equipped with four excitation lasers, depletion laser 775 nm and four single photon counting detectors. For more detailed microscope characteristics please see the section "Microscope".

Basic introduction to STED microscopy can be found here:

<https://abberior-instruments.com/knowledge/microscopy-tutorials/sted/>

## Application

- Two-color 2D and 3D super-resolution images obtained by STED technique with a pulsed depletion laser 775 nm and pulsed excitation 561 nm and 640 nm
- STED RESCUE and DYMIN mode available (STED imaging mode that significantly reduces the light dose sent onto the sample without compromising the resolution)
- 2D and 3D STED images available also with water immersion objective
- Multicolor confocal scanning system with variable pinhole size
- Possible FLIM or FCS acquisition
- Live cell imaging
- NIR confocal imaging (775 nm excitation)

## Microscope

Inverted confocal microscope Nikon Eclipse Ti-E equipped with a piezo Z-stage, motorized XY stage, Perfect Focus System, transmitted light lamp (100 W) and following units:

Software	<b>Inspector</b> with EasyCommander module
Epifluorescence	<b>CoolLED pE-4000</b> (excitation range: 405±20 nm, 480±20 nm, 560±20 nm, 640±20 nm)
Excitation lasers	<b>cw - 405 nm, pulsed - 485 nm, 561 nm, 640 nm, and 775 nm</b>
STED laser	<b>775 nm</b> (40 MHz pulsed laser, for 2D and 3D STED)
Donut formation	Programmable <b>Spatial Light Modulator</b> – 775 nm
Scanner	<b>Abberior QUAD scanner</b> : line frequency up to 2.5 kHz
Objectives	Nikon CFI <b>Plan Apo Lambda 60x Oil, NA 1.40</b> , WD 0.13 mm Nikon CFI <b>Plan Apo 60x WI, NA 1.27</b> , WD 0.17 mm, Correction Collar 0.15-0.19, DIC Nikon CFI <b>Plan Apo Lambda 10x, NA 0.45</b> , WD 4 mm, DIC
Emission filters	422-467 nm 500-550 nm 580-630 nm 650-720 nm or 800-870 nm
Pinholes	16 pinholes from 25 µm to 2 mm
Detectors	4x <b>Photon Counting Module</b> (Excelitas Technologies) <ul style="list-style-type: none"><li>o Two time resolved detectors optimized for FLIM</li><li>o High detection sensitivity for red light (&gt;62% for 680nm)</li></ul>

	<p><b>PMT</b> for transmitted and reflected light (Hamamatsu Photonics)</p> <p>Monochrome <b>widefield camera DMK 23U274</b> (Imaging Source)</p> <ul style="list-style-type: none"><li>• CCD sensor, 1600×1200 (1.9 MP), up to 20 fps, pixel size 4.4 μm x 4.4 μm</li></ul>
FLIM	Externally connected TCSPC card: TimeHarp260N (PicoQuant)