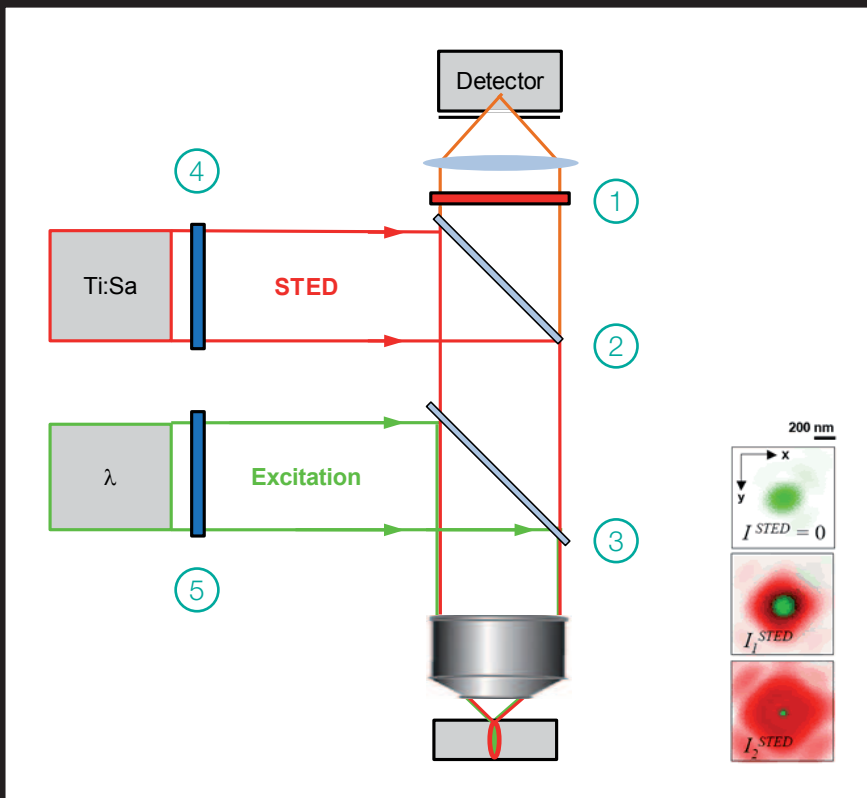


# OPTICAL FILTERS

individual designs for STED microscopy



## TYPICAL STED-SETUP

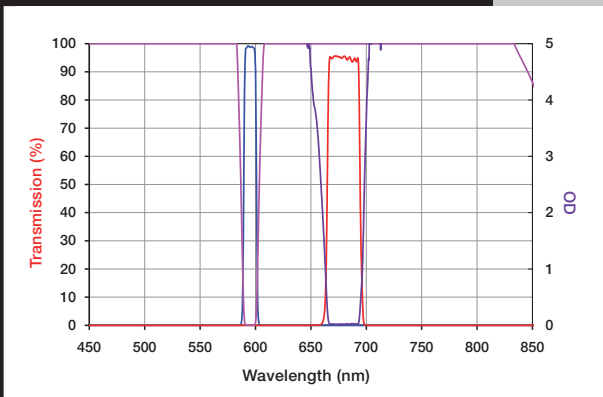
- (1) STED-emitter
- (2) Special STED-grade shortpass-dichroic
- (3) Special STED-grade longpass-dichroic
- (4) Laser clean-up filter (e.g. shortpass laser filter)
- (5) Laser clean-up filter (e.g. narrowband laser line filter)

► **For STED** a subpicosecond laser pulse is used for excitation, producing an ordinary diffraction limited spot of excited molecules. The excitation pulse is immediately followed by a depletion pulse (STED-pulse), which is red-shifted in frequency to the emission spectrum of the dye, so that its lower energy photons act ideally only on the excited dye molecules, quenching them to the ground state by stimulated emission. Thus the excited molecules cannot fluoresce because their energy is dumped and lost in the STED pulse. By spatially arranging the STED-pulse in a doughnut mode, only the molecules at the periphery of the spot are quenched, the fluorescence in the center remains unaffected.\*

\* Klar, T. A., S. Jakobs, M. Dyba, A. Egner and S. W. Hell (2000). „Fluorescence microscopy with diffraction resolution limit broken by stimulated emission.“ Proc. Natl. Acad. Sci. USA 97(15): 8206-8210.

## STED EMITTER AND LASER CLEAN-UP

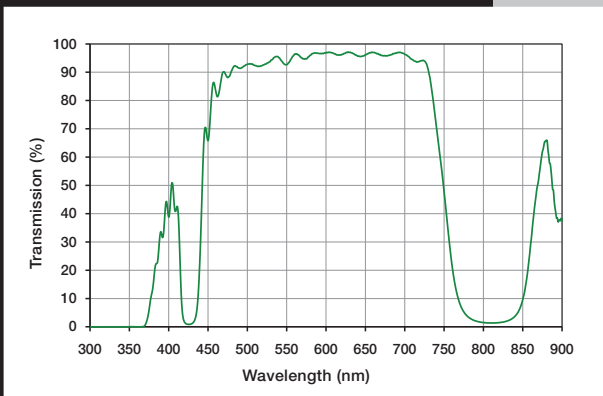
- :: Narrowband **clean-up** filter (5) or
- :: Shortpass laser clean-up (4)
- :: STED **emitter** (1) dye specific, maximum transmission, blocked to all lasers



(e.g. F49-594 / F39-681,  
ZET 594/10x / HC 680/30)

## STED SHORTPASS DICHOIC (2)

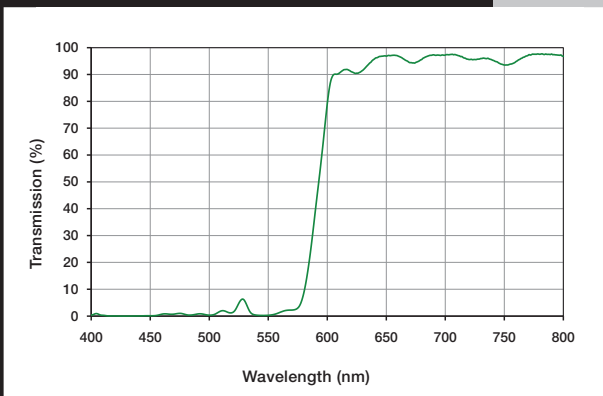
- :: For reflection of STED-Laser (Ti:Sa)
- :: Transmission of fluorescence signal
- :: STED-grade specification,  $\lambda/10$  flatness, Substrate thickness 5-6 mm
- :: Various designs according to laser application



(e.g. F33-780s, z 780 sprdc)

## STED LONGPASS DICHOIC (3)

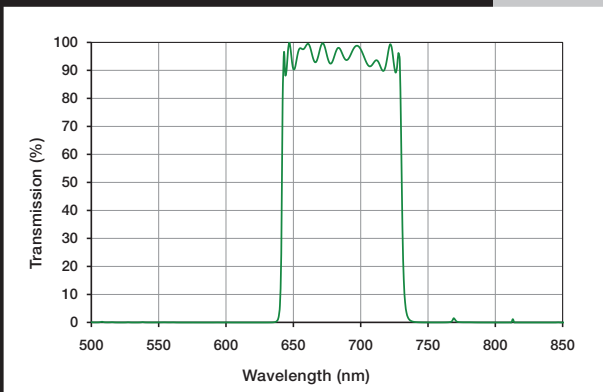
- :: For reflection of laser excitation
- :: Transmission of fluorescence signal
- :: STED-grade specification,  $\lambda/10$  flatness, Substrate thickness 5-6 mm
- :: Various designs according to laser application



(e.g. F43-594, 590 DCXR)

## STED DICHOICS CUSTOM DESIGNS

- :: For individual STED set-ups
- :: Maximum transmission and reflection
- :: STED-grade specification
- :: Various individual dichroic designs according to laser and dye applications



(e.g. F73-746, zt 625-745 rpc)