Press Release

December 6, 2019

High Power Ultrafast Fiber Laser for Two-Photon Microscopy

The FemtoFiber ultra 920 is the new member of TOPTICA's third generation ultrafast fiber lasers for spectroscopy and two-photon microscopy. The system delivers laser pulses shorter than 100 fs at a central wavelength of 920 nm with more than 1.5 W of average output power.

Nonlinear microscopy has become a key technology in biological imaging enabling three-dimensional, noninvasive studies of biological tissue on the submicron scale. The new **FemtoFiber ultra 920** is designed to meet the needs of the community for a reliable, compact and cost effective solution. The laser features a pulse duration <100 fs with a center wavelength of 920 nm and 1.5 Watt of average power (18.5 nJ at 80 MHz repetition rate). The unmatched temporal and spatial beam characteristics of the laser are fully tailored for deep-tissue nonlinear microscopy, providing excellent optical contrast and signal-to-noise.

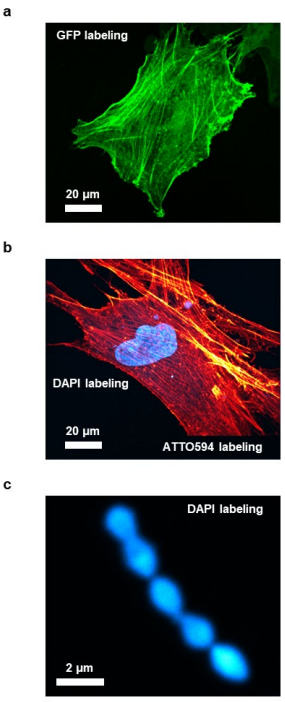
The FemtoFiber ultra 920 provides a small laser head with a footprint of only 23 x 15.5 cm². The laser head is designed to ensure minimum heat dissipation to its environment and therefore provides highest stability with respect to beam pointing. For more flexibility, the design also allows mounting the laser head into any integrators environment, even under various orientations (vertical/horizontal). The laser system comes with an 19“-type standard rack (3 units height) control and supply unit which is connected via detachable fiber and electronic lines of typ. 2 meters length.

The FemtoFiber ultra 920 is a great solution for applications in non-linear microscopy that are based on two-photon excitation of fluorescent proteins or rely on SHG-based contrast mechanisms. With an emission wavelength of 920nm, the laser is perfectly tuned to efficiently excite green and yellow fluorescent proteins (GFP, YFP), which are commonly used e.g. in neurosciences and other biophotonic applications. With that, this fiber laser perfectly closes the wavelength gap in between the already existing FemtoFiber ultra systems at 780 and 1050 nm.

The FemtoFiber ultra 920 laser will be displayed at Booth 3209 during the BiOS/Photonics West 2020 (Feb 1st – Feb. 6th) in San Francisco.

For more information visit www.toptica.com/bright

FemtoFiber ultra 920 – powerful and compact 920 nm femtosecond laser system with turnkey operation and cost-effective design for multiphoton and second harmonic generation (SHG) microscopy.



Two-photon microscopy images using the FemtoFiber ultra 920 for fluorescence excitation.
a, Image of a human stem cell expressing GFP attached to its actin network. **b,** Human stem cell with ATTO594 labeling of the actin network and DAPI labeling of the cell nucleus.
c, S.pneumoniae bacteria labeled with DAPI.

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TOPTICA has been developing and manufacturing high-end laser systems for scientific and industrial applications for 20 years. Our portfolio includes diode lasers, ultrafast fiber lasers, terahertz systems and frequency combs. The systems are used for demanding applications in biophotonics, industrial metrology and quantum technology. TOPTICA is renowned for providing the widest wavelength coverage of diode lasers on the market, providing high-power lasers even at exotic wavelengths.
Today, TOPTICA employs 300 people worldwide in six business units (TOPTICA Photonics AG, eagleyard Photonics GmbH, TOPTICA Projects GmbH, TOPTICA Photonics Inc. USA, TOPTICA Photonics K.K. Japan, and TOPTICA Photonics China) with a consolidated group turnover of € 60 million.