

2024 Innovators Awards: Meet the honorees



This year's honorees represent a who's who within the growing photonics and optics market.

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Innovation should play a meaningful role for any industry—but there is something special about each innovation within the photonics and optics realm. After all, each innovation within this space enables other industries to take the next step.

This year's submissions are no exception. There are some truly groundbreaking innovations that will ultimately change the many products impacting our daily lives for years to come. Everyone on this list deserves recognition.

Spectrolight, Inc.

Tunable Laser System

Spectrolight's tunable laser system (TLS) is an innovative, continuously tunable one-box laser system that combines a supercontinuum laser and Flexible Wavelength Selector (FWS: tunable bandpass filter) based on TwinFilm™ technology. TLS is the world's first picosecond tunable laser system covering the visible to SWIR range.

The main advantages of TLS are broadband continuous center wavelength and bandwidth (FWHM) tuning, high average power, easy control, low maintenance, and price. TLS has ultra-broadband wavelength tuning capability up to SWIR (410–1700 nm) with a precision of 1 nm and can control the FWHM 2 to 15 nm (nominal). High output power (>5 mW/nm [average]) can be produced with very high throughput compared to methods using nonlinear optics such as OPA. TLS does not require difficult alignments or adjustments, and the center wavelength and bandwidth can be controlled in real time using dedicated software. It can be applied to a variety of purposes at a relatively low price, and various models are available depending on the output power.

TLS has TLS-Red and TLS-Blue models, depending on the difference in bandwidth control function. TLS-RED can produce wide wavelength ranges of approximately 400 to 1700 nm and has a controllable FWHM of 2 to 15 nm (nominal), and TLS-BLUE has the same wide wavelength ranges with fixed FWHM at 10 or 20 nm. TLS-RED is suitable for fields that require precise scanning, and TLS-BLUE is ideal for fields that require high output power.

Spectrolight's TLS allows users to freely select the output power and wavelength ranges according to their needs. TLS has customized models, and depending on the application, users can choose from supercontinuum laser models and the variable wavelength range of FWS. TLS can be applied to various applications due to its broadband wavelength tunability. For example, TLS can be applied as an excitation light source in fluorescence microscopy. There are more than tens of thousands of types of dyes used in fluorescence microscopy, but optical excitation filters suitable for each dye are limited. TLS enables the best fluorescence imaging by using the optimal wavelength of the fluorophore. And because TLS is a picosecond pulsed laser, it can be applied to time-resolved spectroscopy and microscopy, such as TCSPC and FLIM. TLS can be applied for inspection in various applications, including semiconductors, machine vision, pharmaceuticals, environmental monitoring, food and agriculture, forensics, art and artifact analysis, and material science. Spectroscopy and microscopy are powerful techniques for identifying and analyzing substances based on their interaction with light. TLS can be used as an important source of these technologies.



Spectrolight's tunable laser system (TLS).