

NEW PRODUCTS

Focus on spectroscopy and photonics

The descriptions of the new products listed in this section are based on information supplied to us by the manufacturers. PHYSICS TODAY can assume no responsibility for their accuracy. For more information about a particular product, visit the website at the end of the product description. For all new products submissions, please send to Rnanna@aip.org.

Andreas Mandelis



Optical time-domain reflectometer

The FTE7000A-DWDM OTDR from Terahertz Technologies is a tunable dense wavelength-division-multiplexing optical time-domain reflectometer with 96 wavelengths from the C-band spectrum. The handheld instrument can be used for commissioning and troubleshooting DWDM metro Ethernet networks, and it also operates as a tunable light source with 0 to +5 dBm output. The reflectometer offers one-touch auto test, has an automatic pass/fail summary with the company's Fib-R-Map trace analysis, and allows for testing through multiplexer and demultiplexer units. The supplied CertSoft software can be used to produce complete networks test documentation. The FTE7000A-DWDM OTDR also includes an auto pass/fail video scope with auto image centering. **Terahertz Technologies Inc**, 169 Clear Rd,

Oriskany, NY 13424, www.teratec.us

Visible diode laser modules

Coherent has expanded its Dilas family of CW fiber-coupled diode laser modules with two visible wavelengths: 2 W at 520 nm (green) and 1.4 W at 638 nm (red). The OEM modules are based on the Dilas series' multi-single-emitter technology and, according to Coherent, provide high optical efficiency and excellent beam quality. The modules avoid a trade-off between power and coupling efficiency by merging the output of several single emitters into one fiber by means of proprietary beam-combining and beam-shaping optics. As a result, the modules combine the coupling efficiency and output quality of a single emitter with the higher power of a multiemitter bar. The lasers are suitable for various photonic and biophotonic applications that require multiple watts of green or red visible light. Examples include confocal microscopy, drug discovery, multiwavelength flow cytometry, and pumping titanium:sapphire lasers. **Coherent Inc**, 5100 Patrick Henry Dr, Santa Clara, CA 95054, www.coherent.com

Software for fluorescence spectrometers

PicoQuant has released a new version of the EasyTau system software for its FluoTime 300 fluorescence lifetime spectrometer, which measures time-resolved and steady-state fluorescence spectra and has steady-state and phosphorescence options. A major focus is the interface integration that allows for remote execution of scripts written in the EasyTau language. With the script integration, the spectrometer can control third-party accessories, such as the Biomek NX[®] liquid handling automation workstation from Beckman Coulter. Several EasyTau wizards have been optimized in the current release. The quantum yield wizard offers an improved workflow for samples with low quantum yields, and another allows for the measurement of phosphorescence spectra generated by picosecond pulsed laser excitation. The user-customizable scripts simplify sophisticated spectroscopic experimentation, even for novices. **PicoQuant**, Rudower Chaussee 29, 12489 Berlin, Germany, www.picoquant.com



Detectors for ultrafast spectroscopy



Andor Technology, an Oxford Instruments company, has launched a spectroscopy mode on its high-speed, low-noise Zyla and iStar scientific CMOS platforms. On-head camera intelligence has binned single or multitrack spectra that are user configurable and have a high dynamic range. On the Zyla 5.5, the spectroscopy mode provides spectral rates of up to 27 057 sps for high-resolution, low-light, high-dynamic-range transient spectroscopy applications that have a time resolution of tens of microseconds. Its multitrack mode, which has up to 6000 acquisitions/s, can be used for hyperspectral imaging and dual-track, kilohertz transient absorption spectroscopy. The iStar combines the low noise, high dynamic range, and ultrafast spectral rates—up to 4000 sps—of sCMOS technology with nanosecond time resolution. Its applications include plasma, laser-induced breakdown, pulsed fluorescence, and photoluminescence spectroscopy. **Andor USA**, 300 Baker Ave, Ste 150, Concord, MA 01742, www.andor.com

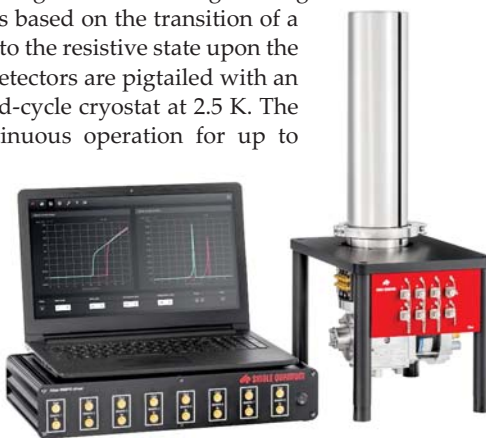


Imaging spectrograph

Princeton Instruments engineered its SpectraPro HRS-300 imaging spectrograph to deliver high spectral resolution and astigmatism correction for advanced micro-spectroscopy and multichannel fiber applications. The optical performance is optimized by ResXtreme spectral deconvolution technology, which the company claims can improve spectral resolution, peak intensities, and consistency by as much as 60% across the 2D focal plane. The 300 mm instrument allows for experimental versatility. For example, dual exit ports, each with a 30 mm focal plane, permit mounting and operation of two array detectors or enable the instrument to operate as both a monochromator and a spectrograph. The SpectraPro HRS can use up to three interchangeable triple-grating turrets. Applications include Raman and laser-induced breakdown spectroscopy, photoluminescence, fluorescence, and plasma diagnostics. **Princeton Instruments**, 3660 Quakerbridge Rd, Trenton, NJ 08619, www.princetoninstruments.com

Superconducting nanowire single-photon detectors

Single Quantum's Eos is a multichannel superconducting nanowire single-photon detection system that combines high detection efficiency, high time resolution, low dark count rate, and short dead time. It can detect single photons with higher than 85% efficiency over a broad spectral range and an ultrahigh timing resolution of less than 15 ps. The detection principle is based on the transition of a nanowire from the superconductive to the resistive state upon the absorption of a single photon. The detectors are pigtailed with an optical fiber and operated in a closed-cycle cryostat at 2.5 K. The plug-and-play design enables continuous operation for up to 10 000 hours and requires no liquid-helium consumption. The system is designed for optical measurement applications in quantum information technology, quantum communication, quantum cryptography, IR time-resolved spectroscopy, and lidar. **Single Quantum BV**, Delfgauwseweg 271, 2628ER Delft, the Netherlands, www.singlequantum.com



P-polarized beamsplitters

MKS Instruments has announced Newport Femto-Optics p-polarized beamsplitters optimized for femtosecond-laser-pulse manipulation. Suitable for advanced research and industrial applications, they offer several reflectance and transmission ratios for ultrafast lasers that produce intense pulses of 25 fs or less. The beamsplitters are designed for p-polarized incident light and a 45° angle of incidence. They allow the wavelength range of titanium:sapphire laser beams to be split with reflectivities of 67%, 76%, 80%, and 90%. A slightly increased substrate thickness prevents thermally induced deformation. The coating materials and design were selected to create minimal group delay dispersion upon transmission and reflection. The beamsplitters provide a constant splitting ratio over the specified bandwidth and feature low wavefront distortion. **MKS Instruments Inc**, 2 Tech Dr, Ste 201, Andover, MA 01810, www.mksinst.com



Optical coherence tomography spectrometer



The Cobra-S optical coherence tomography (OCT) spectrometer from Wasatch Photonics offers ultrahigh speed of 250 000 lines/s and enhanced roll-off performance for deep sample penetration and high image clarity. It is suitable for various spectral-domain OCT applications, including ophthalmology, angiography, and industrial use, and can be designed into near-IR OCT systems for research and OEM applications. According to the company, at 250 kHz, the Cobra-S delivers line scan rates two to three times higher than other commercially available spectrometers and generates superior data. The spectrometer package, which includes 12 options for athermal optomechanics, helps the Cobra-S to maintain its performance level over a wide range of operating conditions. The instrument has a compact, modular design and is available in multiple configurations to cover different wavelength regions. **Wasatch Photonics**, 1305 N 1000 W, Ste 120, Logan, UT 84321, <http://wasatchphotonics.com>

Picosecond laser system

Auréa Technology offers its Pixea laser system for OEM and R&D applications that generate ultrashort optical pulses by means of gain-switched laser diode technologies. According to the company, the series features high-quality picosecond laser pulses with no satellite pulses and pulse tail minimization. It offers various centered wavelengths between 375 nm and 2 μ m. The pulse duration, down to 20 ps, is optimized for each wavelength. Available output options include free-space collimating and fiber-coupled optics. The Pixea features very low jitter, a repetition rate from single shot to 120 MHz, continuous tuning of the repetition rate up to 100 MHz, peak power up to 500 mW, and dual-mode—pulsed or CW—operation. The system laser head and the dedicated control unit are configured in one or two system modules. Applications include accurate time analysis, materials characterization, and laser seeding. **Auréa Technology**, 18 rue Alain Savary, Besançon 25000, France, www.aureatechnology.com

NEW PRODUCTS

Single-photon counter



Qutools has released the quTag, a high-speed, low-jitter, time-correlated single-photon counting system. Via USB 3, it transfers up to 100 Mcps of time tags to a PC at a jitter of 10 ps RMS or less. The standard module offers four stop channels, one start (or sync) channel, and an external clock input. At any time, the system can be extended by multiples of four stop channels. The dead time of the inputs is 40 ns. The supplied software lets users access time tags, various types of histograms, and filters in order to process the measurement data. They can control the software through a graphical user interface or dynamic-link library. Example code is supplied for C/C++, LabVIEW, and Python. Applications for the quTag include quantum optics, single-photon source characterization, fluorescence and phosphorescence lifetime imaging microscopy, fluorescence correlation spectroscopy, Förster resonance energy transfer, and lidar. **Qutools GmbH**, Kistlerhofstr 70 (Geb. 88), 81379 Munich, Germany, www.qutools.com



Photoluminescence spectrometer

Edinburgh Instruments has announced its FLS1000 modular photoluminescence spectrometer for applications in photophysics, photochemistry, and materials and life sciences.

Suitable for both steady-state and time-resolved spectroscopy, the system can be configured for spectral measurements from the UV to the mid-IR range and for lifetime measurements spanning time resolutions from picoseconds to seconds. High sensitivity is required to measure low sample concentrations, small sample volumes, and low-luminescence quantum yields. According to Edinburgh Instruments, the spectrometer's ultimate sensitivity of greater than 30 000:1 for the standard water Raman measurement is unmatched by other available instruments. The FLS1000 comes with the company's updated Fluoracore software for data acquisition and analysis and 325 mm focal length monochromators that provide high stray-light rejection, high accuracy, and minimum step size. **Edinburgh Instruments Ltd**, 2 Bain Sq, Kirkton Campus, Livingston, EH54 7DQ, UK, www.edinst.com

Laser wavelength combiner

For the compact, flexible laser combiner from Hübner Photonics, users can select up to 6 visible-spectrum wavelengths from the 30 that are available. The C-Flex is designed to integrate Cobolt's diode and diode-pumped solid-state (DPSS) lasers, but it will accommodate lasers from most vendors. Free-space beam output and fiber coupling options are available. The combiner offers full modulation capability and streamlined operation via a single computer interface. Optional acousto-optic modulators can be integrated as fast drivers of the DPSS lasers and for power regulation. Since the C-Flex is field-upgradable, lasers can be added as needed. According to the company, that makes it especially suitable for life-sciences research. The instrument is passively cooled, and an active cooling module is available. Applications include fluorescence microscopy, flow cytometry, optogenetics, and photochemistry. **Hübner GmbH & Co KG**, Heinrich-Hertz-Str 2, 34123 Kassel, Germany, www.hubner-photonics.com



Laser diode emission combiner



Toptica has added to its iChrome family of multilaser engines for biophotonics applications. Optimized for confocal microscopy, the iChrome CLE has four laser sources in one compact box. It provides up to 20 mW of output power at 405, 488, 561, and 640 nm, a combination of wavelengths that enables one fully integrated device to excite the most popular fluorophores. According to the company, the iChrome CLE is the first all-diode laser combiner; it includes a diode-based 561 nm frequency-doubled diode laser source. The novel design ensures identical analog and digital modulation behavior of up to 1 MHz for all laser lines. Another feature, the "complete-off," ensures that all lasers, including the 561 nm line, emit no residual light in the "off" state, even if modulated at 1 MHz. All wavelengths can be controlled by a unified user interface that features analog and digital inputs, RS-232, and Ethernet.

Toptica Photonics Inc, 1286 Blossom Dr, Victor, NY 14564, www.toptica.com

High-speed spectrometer

The Ocean FX spectrometer from Ocean Optics features a very high acquisition speed of up to 4500 scans/s, a high-sensitivity CMOS detector, onboard spectral buffering, and Ethernet communications. The combination of rapid acquisition speed and a minimum integration time of 10 μ s makes the spectrometer suitable for applications that involve high-intensity output, transient events, and reaction monitoring. With the Ocean FX, users can more easily avoid saturating the detector in high-light-level measurements by integrating the signal over much briefer periods—microseconds versus milliseconds. According to the company, the instrument delivers more reliable results and is more easily integrated into a wider range of environments than other types of spectrometers. Applications include laser characterization and light measurement, protein fluorescence kinetics and other chemical reactions, and high-speed sorting and color measurements. **Ocean Optics Inc**, 830 Douglas Ave, Dunedin, FL 34698, <https://oceanoptics.com> **PT**