Focus on photonics, spectroscopy, and spectrometry

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 its description. Please send all new product submissions to ptpub@aip.org.

Andreas Mandelis

Multiple-color, pulsed diode laser

PicoQuant's new picosecond laser, Prima, gives researchers access to three excitation wavelengths in one compact laser module. Prima generates laser light at 635, 510, and 450 nm, with each color emitted individually, one at a time. The three wavelengths cover most of the excitation needs for daily laboratory tasks, such as lifetime or quantum-yield measurements, photoluminescence, and fluorescence. Prima supports pulsed operation with repetition rates of up to 200 MHz, CW mode with fast switching capability, and rise and fall times of less than 3 ns. When the laser is in pulsed mode, an average optical output power of typically 5 mW can be achieved for each wavelength, and up to 50 mW in CW mode. Because of its standalone design, no additional laser driver is necessary. According to the company, Prima's flexibility and ease of use make it a versatile yet affordable tool for many research applications in the life and materials sciences. ***PicoQuant**, Rudower Chaussee 29, 12489 Berlin, Germany, www.picoquant.com*

Laser for quantum measurements

Toptica has expanded its CTL product line, which comprises lasers for exciting microcavities or quantum dots, pumping microcombs, and testing components. The newest member of the family, the CTL 900, is tunable between 880 nm and 950 nm. That wavelength range is especially useful for nanophotonics and spectroscopy, for resonantly exciting quantum dots, and for addressing, for example, rare-earth ions or the cesium D_1 line. The CTL lasers provide wide, continuous tunability without mode hops. They offer high power, a narrow linewidth of less than 10 kHz, and low drift, and they can perform scans with high resolution. That unique combination of features enables researchers to perform measurements at the quantum limit. A test-system mode is included and can characterize components or record spectra. ***Toptica Photonics Inc**, 5847 County Rd 41, Farmington, NY 14425, www.toptica.com*

Ultrafast quantum cascade photodetector

Hamamatsu Photonics has announced its creation of the world's first quantum cascade photodetector (QCD), the P16309-01. The new QCD's sensitivity to mid-IR light was achieved by leveraging a quantum-structure design technology and circuit-design expertise the company accrued through developing quantum cascade lasers. The P16309-01 QCD delivers a cutoff frequency of 20 GHz with no cooling, the highest response bandwidth of any currently available mid-IR photodetector operating at room temperature, according to Hamamatsu. Using the ultrafast QCD as a photodetector for analytical instruments allows the measurement of chemical reactions such as combustion and explosion on a scale of picoseconds. The company says that it has previously been impossible to perform analysis at extremely short time intervals. Other promising applications include high-speed, large-capacity spatial communications and long-range lidar. The new QCD is suitable for use by research institutes, analytical instrument manufacturers, telecommunications carriers, and more. ***Hamamatsu Corporation**, 360 Foothill Rd, Bridgewater, NJ 08807, www.hamamatsu.com*

Ultrastable laser

Menlo Systems designed its ORS-Mini, an ultrastable laser with less than 2 Hz linewidth, as a 19-inch compact, rack-mountable module for field applications. It offers a laser frequency stability (also known as the modified Allan deviation) of less than 5×10^{-15} in 1 s and phase noise of −94 dBc/Hz at 10 kHz offset. The system's centerpiece is a 5 cm high-finesse ultralow-expansion cavity licensed from the UK's National Physical Laboratory. According to the company, the cubic cavity design provides the lowest vibration sensitivity reported to date. It enables a rigid cavity mounting and allows for mobile use of the apparatus. The laser system is available at 1542 nm and 1064 nm wavelengths. It operates fully autonomously, can be intuitively controlled via touch screen, and is remotely accessible via a network connection. The ORS-Mini was conceived as an ultrastable optical reference intended for terrestrial use. It is suitable for applications in quantum computation, as a source of ultralow-noise microwaves for radar systems, as a flywheel in optical clocks, for frequency dissemination via optical fibers, and in various spectroscopic experiments. ***Menlo Systems Inc**, 56 Sparta Ave, Newton, NJ 07860, www.menlosystems.com*

Ultracompact spectrometer module

The latest addition to Ibsen Photonics' platform of ultracompact spectrometers is the Pebble NIR OEM model, which measures only 23 mm × 21 mm × 8 mm. At its core is Ibsen's highly effective transmission grating, a key benefit of which is a high resolution of 12 nm across the full 950–1700 nm wavelength range. Because Pebble uses a compact indium gallium arsenide detector array with short integration time and a large numerical aperture of 0.22 (low f-number of *f*/2.2), it is very sensitive and fast for such a small spectrometer. Its pure transmission-based optics ensure good thermal stability and facilitate real-time fluorescence or absorbance measurements in the field. The cost-effective, rugged Pebble is a handheld and portable multispectral instrument suitable for use in biophotonics, medical, food, and precision-agriculture applications. ***Ibsen Photonics A/S**, Ryttermarken 17, DK-3520 Farum, Denmark, https://ibsen.com*

Eye-safe lasers

Frankfurt Laser has brought to market its FERT-1535-XXXμJ-Q series of 1535 nm erbium glass lasers, which are designated as "eye-safe" because of the wavelength range in which they operate. The diode-pumped passively Q-switched lasers have pulse energies of 40–2000 μJ and peak powers of 10–133 kW. The output beam has a diameter of 0.2 mm with a divergence of ≤12 mrad. The operating temperature ranges from −40 °C to 65 °C. Just 34 mm in length, 18 mm in width, and 7.7 mm in height, the lasers are very compact. Those features and their high reliability make the eye-safe lasers suitable sources for applications such as laser range-finding, laser imaging, and surveying equipment. ***Frankfurt Laser Company**, An den 30 Morgen 13, D-61381 Friedrichsdorf, Germany, https://frlaserco.com*

Trace VOC analyzer

Ionicon developed its high-resolution PTR-TOF-MS trace VOC analyzer, the PTR-TOF 10k, for challenging samples and complex mass spectra, where the additional insight provided by high mass-resolving power is a major asset for the analysis. (PTR-TOF-MS denotes "proton transfer reaction time-of-flight mass spectrometer" and VOC denotes "volatile organic compound.") Powered by the company's novel ioniTOF 10k, the PTR-TOF 10k features an exceptional mass resolution of 10 000–15 000 $m/\Delta m$. It allows peak separation and substance identification that would not have been possible with lower-resolving instruments, according to Ionicon. The PTR-TOF 10k offers a detection limit of less than 1 pptv, a response time of less than 100 ms, and sensitivity greater than 1000 cps/ppbv. It uses TRU-E/N, a patented Ionicon ion-chemistry quality standard that ensures precise electric field strength (E/N) conditions, well-reproducible measurement results, and the highest possible level of quantification accuracy. ***Ionicon Analytick GES mbH**, Eduard-Bodem-Gasse 3, 6020 Innsbruck, Austria, www.ionicon.com*

X-ray fluorescence spectrometer

Applied Rigaku Technologies, a division of Rigaku Corporation, has unveiled its NEX CG II, an indirect-excitation analyzer for energy-dispersive x-ray fluorescence (EDXRF). The multielement, multipurpose NEX CG II delivers rapid qualitative and quantitative elemental analyses of solids, liquids, powders, coatings, and thin films. According to the company, the second-generation spectrometer advances EDXRF with its unique close-coupled Cartesian-geometry (CG) optical kernel and hardware upgrades. Its high-power 50 kV and 50 W x-ray tube, a high-performance large-area silicon drift detector, and Rigaku's advanced Fundamental Parameters software enhance analytical sensitivity and ease of use. The NEX CG II provides nondestructive analysis of sodium to uranium in almost any matrix and measures ultralow and trace-element concentrations up to percent levels. Users can achieve the lowest limits of detection for elements in highly scattering matrices such as water, hydrocarbons, and biological materials. ***Rigaku Americas Corporation***, *9009 New Trails Dr, The Woodlands, TX 77381-5209, www.rigaku.com*

Spectroradiometer series

Admesy's versatile new spectroradiometer platform, its Neo Series, is suitable for a wide array of spectral measurement needs in development and production applications. The series can perform analytical, transmission, and absorbance testing and can be used for solid-state lighting applications such as LED testing, thin-film coating, and other demanding areas. Neo is robust and easy to integrate and, according to the company, ensures high optical performance, accuracy, and repeatability even in tough conditions. The cost-effective Neo VIS spectroradiometer is offered for measurements in the visible wavelength range (380–780 nm). The Neo UV-NIR's extended wavelength range (250–1100 nm), with measurement power in the visible, UV, and near-IR ranges, makes it suitable for analytical applications. ***Admesy***, *Sleestraat 3, 6014 CA Ittervoort, the Netherlands, www.admesy.com* PT