NEW PRODUCTS

Focus on photonics, spectroscopy, and spectrometry

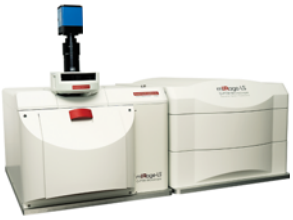
The descriptions of the new products listed in this section are based on information supplied to us by the manufacturers. PHYSICS TODAY can assume no responsibility for their accuracy. For more information about a particular product, visit the website at the end of its description. Please send all new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

Andreas Mandelis

High-power CW laser

Hübner Photonics has released a higher-power model of the Cobolt Twist 457 nm laser from the 05-01 Series platform. Because it delivers up to 300 mW of single-frequency CW output power, the Cobolt Twist is suitable for demanding applications in holography. The 05-01 Series diode-pumped lasers operate at a fixed wavelength between 320 nm and 1064 nm. Single-frequency operation provides an ultranarrow spectral linewidth of less than 1 MHz, a long coherence length of greater than 100 m, and excellent spectral purity. The lasers offer a high-quality TEM_{00} beam, low noise of less than 0.1% rms, and wavelength stability of less than 1 pm over a temperature range of ±2 °C and duration of 8 h. Because all the control electronics are contained in the laser head, the lasers are compact and do not need an external controller. Besides holography, they can be used for interferometry, Raman spectroscopy, optical tweezers, superresolution microscopy, and laser Doppler velocimetry. ***Hübner Photonics Inc**, 2635 N 1st St, Ste 202, San Jose, CA 95134, https://hubner-photonics.com*

Optical photothermal IR spectroscopy



The mIRage-LS IR multimodal microscope and spectroscopy system from Photothermal Spectroscopy combines simultaneous Raman and colocated fluorescence microscopy with submicron IR in a single platform. In addition, the company says new developments in its optical photothermal IR (O-PTIR) spectroscopy technique have pushed the IR spatial resolution to less than 500 nm for life-sciences applications. According to the company, the integrated platform uniquely combines the benefits of fluorescence microscopy to support fast, easy targeting of molecular features of interest with submicron-IR spectroscopy to characterize the molecular structure of biomolecular features, including subcellular and tissue applications. Besides life-sciences applications, the mIRage-LS system and O-PTIR technique are suitable for research in microplastics and polymers. ***Photothermal Spectroscopy Corp**, 325 Chapala St, Santa Barbara, CA 93101, www.photothermal.com*

Rotary vane pump for mass spectrometry

Pfeiffer Vacuum has introduced what it says is the first rotary vane pump for mass spectrometry (MS) that has a hermetically sealed pump housing. The SmartVane serves as a backing pump for inductively coupled plasma MS and liquid chromatography–MS for applications in environmental, food, pharmaceutical, and clinical analytics. The vacuum pump is designed to prevent contamination by ensuring that no oil leaks occur. The integrated motor does not require a conventional seal, which means it needs less maintenance. With its typical operating pressure of less than 10 hPa, the SmartVane is quieter than other pumps used for this type of application, according to the company. Its compact design makes it easy to incorporate in existing systems. The energy-efficient interior-permanent-magnet motor with standby function reduces the pump's operating costs and carbon dioxide footprint. ***Pfeiffer Vacuum Inc**, 24 Trafalgar Sq, Nashua, NH 03063, www.pfeiffer-vacuum.com*

Pulsed, broadly tunable fiber laser

The SuperK Chromatune pulsed fiber laser from NKT Photonics offers gap-free tuning from 400 nm to 1000 nm and a constant output power of 1 mW. The reliable fiber laser is suitable for applications such as spectroscopy, microscopy, optical characterization, fluorescence and lifetime imaging, and plasmonics and metamaterials research. It is designed to be easy to use, but in advanced mode, users can change the linewidth, increase the power in different wavelength ranges, and automate wavelength sweeps and other functionalities. The laser runs at quasi-CW MHz repetition rates as standard, but that can be changed by users studying lifetime phenomena. Everything is controlled by an intuitive software interface, but a free software development kit allows for additional control or integration. ***NKT Photonics Inc**, 23 Drydock Ave, Boston, MA 02210, www.nktphotonics.com*

Rugged UV CMOS camera

The Hawk Indigo camera from Raptor Photonics uses a next-generation ⅔-inch CMOS sensor that enables high UV sensitivity and high quantum efficiency of 36% at 250 nm. With a pixel size of 2.74 µm, the camera achieves a resolution of 8.1 MP. It offers global-shutter, progressive-scan technology to deliver real-time, lag-free images at 15 Hz full frame through a CameraLink interface. The rugged Hawk Indigo can be used in harsh environments; it works from −20 °C to 55 °C but can be equipped to handle more extreme temperatures. Suitable for integration into industrial applications, it offers high precision in the hyperspectral imaging of transparent materials, such as plastic and PET, and semiconductors; wafer and mask inspection; combustion imaging; and high-voltage diagnostics. ***Raptor Photonics Ltd**, Willowbank Business Park, Larne, Co Antrim BT40 2SF, Northern Ireland, UK, www.raptorphotonics.com*

SWIR camera

The pco.pixelfly 1.3 shortwave-IR (SWIR) camera from Excelitas offers high performance in machine vision due to its indium gallium arsenide image sensor. The Sony model IMX990 sensor is highly sensitive in the shortwave-IR, near-IR, and visible ranges, with sensitivity up to 90% in the shortwave-IR region. The 5 µm × 5 µm pixels enable the use of small-magnification optics in microscopy. A low dark current facilitates long exposure times with excellent quantum efficiency of greater than 90%. The pco.pixelfly 1.3 SWIR camera is suitable for various applications, including life-sciences research; medical use such as in surgical microscopes, *in vivo* imaging, and *in vivo* and intravital microscopy; smart farming and food-processing quality control; pharmaceutical and other product-packaging industries; and waste sorting. ***Excelitas Technologies Corp**, 200 West St, 4th Fl E, Waltham, MA 02451, www.excelitas.com*

Compact near-IR hyperspectral imagers

Resonon has unveiled two hyperspectral imagers that operate in the near-IR range (925–1700 nm): the Pika IR-L and Pika IR-L+. Compared with the current generation of near-IR imagers, they are smaller, are nearly three times as light, and offer improved spectral resolution, according to Resonon. Their near-IR spectral range is particularly suitable for delineating land and water boundaries, imaging through low clouds and smoke, classifying various minerals and vegetation covers, and contrasting dry and wet soils. Applications for the hyperspectral imagers include scientific research, survey work, and precision agriculture. Airborne systems can be acquired as a kit that includes a data acquisition unit; a GPS receiver and inertial measurement unit; georectification, postprocessing, and analytical software; a system mount for unmanned or piloted aircraft; radiometric calibration, including a target; and a rugged travel case. ***Resonon Inc**, 123 Commercial Dr, Bozeman, MT 59715, https://resonon.com*

Fast, thermally stable spectrometer

A new high-resolution, configurable spectrometer from Ocean Insight provides rapid acquisition speed and high thermal stability for applications ranging from plasma monitoring to pharmaceuticals analysis. The Ocean HR2 spectrometers are compact and robust, with integration times as fast as 1 μs. Thermal wavelength drift of just 0.06 pixels/°C helps ensure reliable spectral performance as temperatures change. Ocean HR2 models cover various wavelength ranges within about 190–1150 nm, with a choice of slit widths to help users manage throughput and optical resolution. The new spectrometers come with the OceanDirect cross-platform software-developers kit, which includes an application programming interface. It lets users optimize spectrometer performance, access critical data for analysis, and enable the High Speed Averaging Mode. That function, available with newer-model Ocean Insight spectrometers, can significantly improve the signal-to-noise ratio. ***Ocean Insight**, 3500 Quadrangle Blvd, Orlando, FL 32817, www.oceaninsight.com*

Microplastics analysis system

Agilent has enhanced its 8700 LDIR (laser direct IR) chemical-imaging system for the analysis of microplastics in environmental samples. The improved package includes Clarity 1.5 software—an upgrade that advances the speed of analysis; enhances spectral acquisition, transformation, and library matching; and provides automated workflows for direct analysis of microplastics on a filter substrate. A redesigned sample holder allows the on-filter sample to be presented to the instrument more easily and consistently. According to Agilent, since the 8700 LDIR brought high-speed analysis and ease of use to IR spectroscopy, it has emerged as the benchmark technique for the analysis of microplastics particles; the development of on-filter analysis for the platform further increases speed and throughput. Increased testing volumes will help facilitate a greater understanding of the extent of microplastics contamination and the development of appropriate environmental standards and regulations. ***Agilent Technologies Inc**, 5301 Stevens Creek Blvd, Santa Clara, CA 95051, www.agilent.com*

IR–AFM spectrometer for nanometrology

The Park NX-IR R300 system integrates advanced IR spectroscopy of photo-induced force microscopy (PIFM) and the Park NX20 300 mm atomic force microscopy (AFM) platform to deliver accurate analysis of the chemical composition of materials. It provides chemical property information and mechanical and topographical data for semiconductor research, failure analysis, and defect characterization on semiconductor wafers up to 300 mm in diameter. According to Park Systems, it does so at an unprecedentedly high nanoresolution. The PIFM spectroscopy provides chemical identification with a spatial resolution of less than 10 nm. It uses a noncontact technique that offers damage-free spectroscopy probing and high resolution and accuracy throughout scans. By providing spectroscopy information at varying depths, the Park NX-IR R300 can offer valuable insight into sample composition. ***Park Systems Inc**, 3040 Olcott St, Santa Clara, CA 95054, https://parksystems.com*

Mass spectrometers for high-mass analysis

Hiden now offers its Cluster series of quadrupole mass spectrometry (MS) systems and components for monitoring high-mass species in gas, residual gas, plasma, and surface analysis. The series was developed particularly to perform the high-mass analysis required to study nanoparticles. Multiple sampling configurations are offered to suit research requirements: Systems include the 9 mm EPIC and the 20 mm DLS-20 for the analysis of species up to 20 000 amu. Components include quadrupole assemblies with pole diameters of 9 mm and 20 mm and high-power RF; they operate at optimum frequency to accommodate the high-mass transmission required in cluster analysis. The series features precision Tri-Filter quadrupole assemblies and an optional 90° ion-beam deflector. For pulsed-deposition processes, time-resolved measurements are offered to a resolution of 50 ns. Applications include nanoparticle, molecular-beam, and precursor and contaminant analysis for high-mass species. ***Hiden Analytical Inc**, 37699 Schoolcraft Rd, Livonia, MI 48150, www.hidenanalytical.com*

Scientific CMOS cameras for life-sciences research

Andor Technology, an Oxford Instruments company, has upgraded its Zyla sCMOS camera series for life-sciences research with its ZL41 Cell 4.2 and ZL41 Cell 5.5. Superseding the Zyla 4.2 Plus, the Zyla ZL41 Cell 4.2 offers a maximum quantum efficiency (QE) of 82% and subelectron read noise. It is suitable for applications that benefit from optimal sensitivity and speed, such as calcium imaging and light-sheet and single-molecule-localization microscopy. The broad QE profile, highly optimized to a wide range of common fluorophores, provides excellent coverage of the visible and near-IR wavelength range. The high sensitivity allows for shorter exposure times, faster frame rates, and reduced phototoxicity. With the company's SRRF-Stream+ technology, the ZL41 Cell 4.2 can cost-efficiently transform a normal fluorescence microscope into a super-resolution microscope. Replacing the Zyla 5.5, the ZL41 Cell 5.5 offers a sensor with a 22 mm format and a QE of 64%. It also features a global-shutter mode suitable for snapshot imaging of fast-moving objects without temporal distortion. ***Andor Technology Ltd**, 7 Millennium Way, Springvale Business Park, Belfast BT12 7AL, UK, https://andor.oxinst.com*

IR Raman microscope

According to Shimadzu, its AIRsight IR Raman microscope is the world's only instrument that lets users perform both IR spectroscopy and Raman spectroscopy; combining the two analytical techniques provides complementary information. When connected with a Fourier-transform IR spectrophotometer, the AIRsight can acquire IR and Raman spectra from the same position in a very small section. Compared with a setup in which both an IR and a Raman microscope are installed, the AIRsight requires less space, and operability is enhanced since the same software can be used to control both techniques. The AIRsight is effective for analyzing aqueous solutions, inorganic substances, and microscopic samples, which are difficult to analyze using just an IR microscope. Applications include the analysis of trace contaminants; research into microplastics; and quality control in the chemical, electrical, electronic, and transportation-equipment fields. ***Shimadzu Scientific Instruments Inc**, 7102 Riverwood Dr, Columbia, MD 21046, www.shimadzu.com* PT