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new products

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.

Lawrence G. Rubin

Focus on spectroscopy

Spectrocolorimeter

StellarNet has introduced the EPP2000-CXR spectrocolorimeter, which measures the color of solid and liquid samples using a fiber-optic reflectance probe, fixture, dip probe, or cuvette holder. The instrument has consistent resolution throughout the 280–900-nm range, has no moving parts, and is applicable for color measurements of food, beverages, industrial and home liquids, and pharmaceuticals. The color analysis system uses a concave grating that enables low stray light levels because it has no mirrors in its optical bench. SpectraWiz software is included to provide CIE L* (a measure of brightness) and a* and b* (color coordinates) data for measurement and tolerancing. To perform color tolerancing, a standard sample is measured and saved for future comparisons. A calculation is then made to show the color differences with other samples. *StellarNet Inc, 14390 Carlson Circle, Tampa, FL 33626, <http://www.stellarnet-inc.com>*

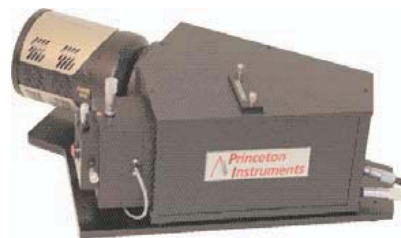
X-ray diffractometer

Varian has announced the SuperNova, a dual-wavelength x-ray diffractometer. It uses high-intensity microsource x-ray technology and includes co-mounted dual-wavelength sources of both molybdenum and copper. Single-crystal x-ray diffraction is used to determine the structure of small molecules and proteins at high resolution. Applications include chemistry, geology, physics, structural biology, and pharmaceutical research. The new system improves throughput in several ways. The high-intensity x-ray radiation and large-area Atlas CCD detector

allow shorter exposure times and enable faster data collection. The duty cycle—the dead time required for the detector to transfer data to the computer—has been substantially reduced. The AutoChem software automates crystal structure solution, refinement, and report generation. *Varian Inc, 3120 Hansen Way, Palo Alto, CA 94304-1030, <http://www.varianinc.com>*

Spectrograph enhancements

Princeton Instruments has added three configurations for its Acton LS785 near-IR lens spectrograph, specifically designed for Raman and fluorescence applications that require the highest throughput. The company combined the spectrograph with its PIXIS deep-depletion CCD camera to produce one spectrometer optimized for the best signal-to-noise ratio; another, the highest spectral rate; and the third, economic high performance. The LS785 series spectrographs feature gold-coated gratings and tunable center-wavelength adjustment to allow different laser excitations, including 785, 805, and 830 nm. The proprietary lens



design provides 94% transmission through the combined lens sets, 65% total system throughput, and outstanding image performance. An optional edge filter holder enables easy laser filtering. *Princeton Instruments, Acton Optics and Coatings, 15 Discovery Way, Acton, MA 01720, <http://www.princetoninstruments.com>*

Subnanosecond transient absorption spectrometer

Ultrafast Systems has developed the Eos transient absorption spectrometer, a broadband optically gated flash photometer designed to work with an amplified femtosecond laser. It uses a photonic fiber for probe light generation; the probe wavelength range is 400–1700 nm. The pump pulse energy required for Eos does not exceed what is

needed for a typical femtosecond transient absorption experiment, and the probe focal spot is comparable to that used in such an experiment. Eos bridges the gap between ultrafast and nanosecond flash photolysis time scales and performs transient absorption experiments with an instrument response function of less than 500 ps and a maximum time window of several seconds. The spectrometer uses low excitation energy that is orders of magnitude lower than in a typical nanosecond experiment. *Ultrafast Systems LLC, 1748 Independence Boulevard, Suite G-6, Sarasota, FL 34234, <http://www.ultrafastsystems.com>*

Thin-film characterization platform

HORIBA Jobin Yvon's DeltaPsi2 is a thin-film characterization platform whose software applies to ellipsometry, polarimetry, and reflectometry and controls all of the company's thin-film metrology instruments. The software can calculate thickness, optical constants, gradients, anisotropy, alloy composition, surface roughness, and other variables. It integrates a large materials database of references and dispersion relations required for accurate characterization of material optical constants. Recent enhancements are focused on automatic modeling operations such as fitting procedures and parameterization of dispersion relations; they incorporate the latest advances in the characterization of periodic structures. The software enables visualization of mapping results on semiconductor wafer and glass panels. *HORIBA Jobin Yvon Inc, 3880 Park Avenue, Edison, NJ 08820-3012, <http://www.jobinyvon.com>*

High-sensitivity spectroradiometer

The GS-1290-X series, advanced, high-speed spectroradiometers from Gamma Scientific, combines the leading-edge sensitivity of backside-thinned CCD



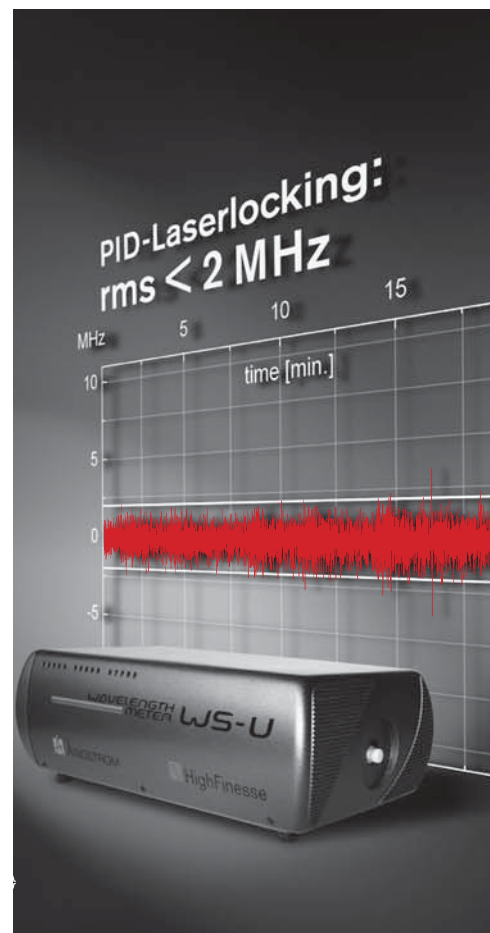
detector technology with the company's RadOMA optoelectrical platform. The three models feature millisecond measurement speed, low-light measurement capability, and superior blue-light region sensitivity compared with conventional front-illuminated CCD-based systems. They cover a wide spectral range from UV to the near-IR: 260–900 nm, 380–810 nm, and 300–1100 nm. The models offer automatic dynamic range optimization, which ensures that system electrical gains are always set for the best results; USB and Ethernet interfaces; and the company's 32-bit Light Touch spectral data acquisition and analysis software package. The GS-1290-X series is self-calibrated. *Gamma Scientific, 8581 Aero Drive, San Diego, CA 92123, <http://www.gamma-sci.com>*

Time-domain NMR reader

Bruker BioSpin Corp has released the HyperQuant, a benchtop nuclear magnetic resonance reader that quantitatively delivers a sample's magnetic hyperpolarization and thermal polarization status. It uses time-domain NMR spectroscopy, a technology similar to magnetic resonance imaging. HyperQuant applies a 0.94-tesla permanent magnet system combined with an innovative magnetic resonance probe design and novel NMR pulse sequences. That combination enables quantification of the thermal polarization level of carbon-13-labeled samples using volumes as low as 1 mL. The key application requirement for the device is that the polarization enhancement factor needs to be determined precisely, so it is crucial to quantify both the hyperpolarization and the thermal polarization on the same sample. There is no need for a separate calibration sample. *Bruker BioSpin Corporation, 15 Fortune Drive, Billerica, MA 01821-3991, <http://www.bruker-biospin.com>*

Optical emission spectrometer

Oxford Instruments has introduced the FOUNDRY-MASTER PRO, a laboratory optical emission spectrometer for complete metal analysis. With its innovative optical system and extended wavelength range of 130–800 nm to cover all elements, the new instrument ensures precise identification and trace analysis of important elements such as nitrogen in steel and phosphorus in



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aluminum. The spectrometer's proprietary detector and readout technology, developed specifically for spectroscopy applications, outperforms conventional phototube-based systems. Its optical design uses a Rowland circle optic in Paschen/Runge mounting and a high-resolution multi-CCD optic with optimized pixel resolution. Options include a wire-adaptor set, sample preparation devices, and spare parts and consumables kits. *Oxford Instruments, Industrial Analysis UK, Halifax Road, High Wycombe, Bucks HP12 3SE, UK, <http://www.oxinst.com>*

X-ray and EUV spectrometer

McPherson has announced the 251MX, an x-ray and extreme UV analytical spectrometer for wavelength dispersive spectral measurements from 0.6 to 20 nm (2000–60 eV). It enables simultaneous spectral detection over a wide range and reduces calibration errors. The instrument is ideal for applications such as soft-x-ray plasma diagnostics, analysis of high-order harmonics generated by coherent EUV lasers, and characterization of EUV sources for high-resolution imaging. It provides corrected, flat-field spectra with its selection of specially designed diffraction gratings. Data are quickly acquired with direct-detection CCDs. The two available gratings, for 0.6–6 nm and



5–20 nm, have square-groove profiles; the laminar design helps to reduce the effects of high diffracted orders. The 251MX is vacuum leak tested and certified. *McPherson Inc, 7A Stuart Road, Chelmsford, MA 01824, <http://www.mcphersoninc.com>*

Color sensor

Delta Computer Systems has developed the microprocessor-controlled CS24D color sensor, which can be programmed to recognize up to 15 colors and communicate the results via four discrete outputs. It uses an array of 24 ultrahigh-intensity LEDs to illuminate

a sample and analyzes the reflected light captured by the sensor's large-area silicon cell. That cell and the intense lighting make it relatively immune to product texture and other noncolor variations. The CS24D takes a new color reading every millisecond, and the discrete outputs are updated. Recognizing a new sample can be done in as quickly as 2–3 ms. The device also allows a number of readings to be averaged, which improves performance in critical applications. The color sensor is intended for on-line use, whereas spectrometer/color vision systems are typically used off line and for standardized color space readings. *Delta Computer Systems Inc, 11719 NE 95th Street, Suite D, Vancouver, WA 98682-2444, <http://www.colorsensors.com>*

Fiber-optic fluorescence probe

Ocean Optics has added the QF600-8-VIS/NIR fiber-optic fluorescence probe to its line of spectroscopy and optical sensing technologies. The probe is designed to eliminate the back reflection from excitation radiation; the result is a greater fluorescence signal than can be achieved using more traditional probe parameters. The QF600-8-VIS/NIR, which works with liquids and solids, has a unique optical design that allows users to control the depth of sampling and to optimize the region of overlap between excitation and emission fibers. It uses one flat fiber to detect and seven angled fibers to direct excitation energy to the region in front of the detection fiber. Different fiber wavelength ranges and solarization-resistant fiber are available as options. *Ocean Optics Inc, 830 Douglas Avenue, Dunedin, FL 34698, <http://www.oceanoptics.com>*

Probe for metrology systems

CAMECA is offering the LEXFAB-300 shallow probe based on the company's nondestructive low-energy x-ray emission spectrometry, a unique surface probing technique. The new tool routinely monitors various processes and tackles yield issues in semiconductor fabrication facilities by performing direct dose measurements—from a few angstroms to several hundred nanometers—of a chosen species in implants or ultrathin films. It addresses



challenges in elemental compositions, thickness determination, and dopant dosimetry from front end to back. The LEXFAB-300 presently can be applied to boron dopant and germanium content in silicon germanium epilayers, to full-wafer dosimetry of low-energy ion implantation and plasma doping, and to barrier metals such as titanium, titanium nitride, and tantalum. CAMECA, 29 Quai des Grésillons, 92622 Gennevilliers Cedex, France, <http://www.cameca.com>

Light measurement systems

Labsphere and Otsuka Electronics Co Ltd of Japan have released the Half-Moon total forward spectral flux measurement systems, available in standard 12-, 20-, and 40-inch diameters. The in-

struments provide an alternative to integrating sphere photometer and goniphotometer methods of measuring total forward spectral flux of forward-emitting lamps, luminaires, and displays. They share the accuracy of the integrating spheres but provide twice the spheres' efficiency. The compact design of the systems creates a virtual integrating sphere by pairing an interior mirrored surface cap with half an orb coated with Labsphere's highly reflective diffuse Spectraflex material. The center sample mounting keeps base electronics and thermal management peripherals out of the detection area to reduce absorption errors. *Labsphere Inc*, 231 Shaker Street, North Sutton, NH 03260, <http://www.labsphere.com>

Scanner and servo motion synchronizer

The Nmark SSaM from Aerotech directly synchronizes scanner and servo motion for marking parts of unlimited size and complexity. Scanners have previously been used with servo axes to mark objects that exceeded the operating envelope of the scanner. In those

cases a move-and-expose sequence was implemented in which the scanner would mark the part and the servo would reposition the part for a subsequent marking operation. By combining the servo and scanner control into a single platform, it is now possible to mark large features by using the continuous motion of the servo axis with simultaneous marking by the scanner. The Nmark SSaM enables complex operations consisting of many small features distributed across a large area to be marked in a continuous fashion. It can be used for carbon dioxide and YAG lasers with specialized functions. *Aerotech Inc*, 101 Zeta Drive, Pittsburgh, PA 15238-2897, <http://www.aerotech.com>

On the Web

An updated website from DYMAX offers improved navigation that enables users to more easily find a product or application from the Adhesive Products, Applications, and Industries Served drop-down menus. New sections have been added for thermal interface materials and medical adhesives for bonding tube sets and fittings. *DYMAX Corporation*, 318 Industrial Lane, Torrington, CT 06790, <http://www.dymax.com>

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