

new products

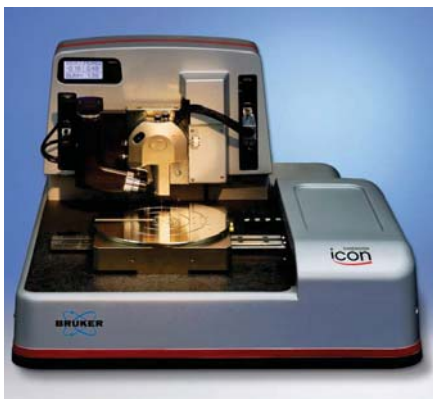
Focus on analytical equipment and diagnostics

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.

Andreas Mandelis

Electrochemical AFM

To aid lithium battery electrochemical atomic force microscopy research, Bruker has released a new accessory that adds a sealed electrochemical cell and turnkey 1-ppm environmental control to its Dimension Icon platform. Created to enable long-term, in situ studies of Li battery electrodes, the electrochemical accessory is designed for the widest chemical solvent compatibility. It combines inert Teflon and Kel-F cell bodies



with a sealed chamber for electrode studies under electrochemical control and in volatile solvents. The cup-shaped cell is designed to allow efficient sample change and connection independent of the counter electrode. The Dimension Icon's motorized stage and proprietary software and a new probe holder made specifically for the cell enable repeated engagement on the same location, even upon adding solvent to a previously dry sample. *Bruker Nano Surfaces Division, 3400 East Britannia Drive, Suite 150, Tucson, AZ 85706, <http://www.bruker.com>*

Gas analyzer for thermal studies

Optimized specifically for measurement of fast-evolved gases, the latest version of the Hiden QGA benchtop mass spectrometer is suited to monitoring diverse thermal and thermo-

gravimetric processes. The system features an integrated interface and analysis system for real-time unequivocal detection of multiple gaseous species to 500 amu. Comprehensive data analysis programs allow for combined presentation of gas species and gas abundances with process temperature status, weight change, and evolution rates. The internal surfaces of the quartz inlet capillary process interface ensure optimum sample integrity from the sample interface to the close-coupled mass spectrometer ionization region. Internal volumes are minimized throughout to achieve response times of just 100 ms. Custom-designed adaptors configured for thermal and thermogravimetric systems provide heated sample interfaces operating to 200 °C with balanced sample flow rates down to 1 scc/minute. *Hidden Analytical, 420 Europa Boulevard, Gemini Business Park, Warrington, WA5 7UN, UK, <http://www.hiddenanalytical.com>*

Vibration isolation workstation

Newport Corp has announced the Vision IsoStation, a vibration isolation workstation offered with scientific-grade optical breadboard platforms in sizes from 24 × 24 to 36 × 72 inches. It has been designed to accommodate applications ranging from small bio-instrumentation isolation to medium-sized optical investigations that may have previously needed a full-sized optical table. Newport's SG series breadboards are highly stable and rigid because of their steel, triple-core-interface honeycomb construction, which increases point-loading capability while minimizing static deflection and provides a lightweight yet rigid work surface. The optical breadboards provide a 3/16-inch, ferromagnetic, stainless-steel working surface; enhanced damping; sealed holes; and surface flatness better than ±0.004 inches over 2 feet (±0.1 mm over 600 mm). *Newport Corporation, 1791 Deere Avenue, Irvine, CA 92606, <http://www.newport.com>*

Vector network analyzers

According to Agilent Technologies, its new PNA-L vector network analyzer models offer design and manufacturing engineers the highest performance—up to 50 GHz—to be found in a midrange VNA. The new N523xA analyzers are available in five frequency models that replace existing N5230C models. Three of them start at 300 kHz, with two or



four ports available for the 13.5- and 20-GHz models and two ports available for the 8.5-GHz product. The other two frequency models, with two ports, start at 10 MHz and include the 43.5- and 50-GHz products. The models offer an improved user interface with a 24% bigger display. They use the Agilent PNA-X's components, including the CPU, display, and hardware, and thus will receive performance improvements whenever the PNA-X hardware is updated. The PNA-L models can run applications such as gain compression and fast continuous wave mode. *Agilent Technologies Inc, 5301 Stevens Creek Boulevard, Santa Clara, CA 95051, <http://www.agilent.com>*

Terahertz and IR band-pass filters

Lake Shore Cryotronics has introduced the BPF series of terahertz and IR band-pass filters for applications for which precision and dependability are needed, especially in extreme environments. The filters are suitable for THz and Fourier-transform IR spectroscopy and materials characterization, THz device characterization and testing, THz and millimeter wave imaging and security, and ground- and airborne-based astronomy and astrophysics. The filters block unwanted energy to reduce noise and enhance signal detection in advanced electro-optical systems. They can also serve as calibration references to provide known frequency and amplitude profiles. Specifically designed for use in cryostats and adjacent to ultrasensitive cooled detectors, Lake Shore's filters have a high ratio of usable

clear aperture area to overall filter size. They are made with an ultrathin gold filter layer for minimal weight. Precision frequency selective surfaces with high spectral resolution provide narrow pass bands with excellent transmission. *Lake Shore Cryotronics Inc.*, 575 McCorkle Boulevard, Westerville, OH 43082, <http://www.lakeshore.com>

Gas analysis systems

Pfeiffer Vacuum's two new gas analysis systems—SPM 220, a sputtering process monitor, and HPA 220, a high-pressure analyzer—are based on PrismaPlus, a mass spectrometer, combined with a dry compressing HiPace turbo pumping station. They are used to monitor and document vacuum processes such as coating architectural glass or thin-film solar cells. Both are available in mass ranges of 1–100 and 1–200 amu; the HPA 220 is also available for 1–300 amu. The SPM 220 incorporates a specially developed ion source that enables the vacuum conditions of sputtering processes and similar applications to be monitored up to a pressure of 10^{-2} mbar. An additional orifice system allows the pressure range to be expanded up to 10 mbar. Depending on the application conditions, the HPA 220 can have three different gas inlet valves that are operable both manually and electro-pneumatically. *Pfeiffer Vacuum Inc.*, 24 Trafalgar Square, Nashua, NH 03063-1988, <http://www.pfeiffer-vacuum.com>

Ion-mobility spectrometer analyzer

Photonis USA and the Georgia Tech Research Corp in Atlanta have designed a prototype of a novel ion-mobility spectrometer analyzer using patented technology from Photonis. The IMS analyzer was conceived to improve performance over current analyzers and to reduce costs. A key component is a Photonis resistive glass product that eliminates the need for complex wire components and heating requirements, thus simplifying the analysis process and reducing the overall cost. Resistive glass, manufactured in a patented process, creates an electric field to guide or direct charged particles. It consists of alkali-doped lead silicate glass that has been reduced to make the surface a semiconductor. It can be drawn into

custom shapes for use in ion guides, drift tubes, capillary inlet tubes, ion mirrors, collision cells, conversion diodes, and voltage dividers. *Photonis USA*, 660 Main Street, Sturbridge Business Park, P. O. Box 1159, Sturbridge, MA 01518, <http://www.photonis.com>

High-precision linear stages

Physik Instrumente now offers the PI miCos product line of precision linear stage positioners. More than 20 product families are available, starting with miniature translation stages and positioning ranges of 40 mm to high-load, linear translation stages for long



travel ranges to 1 m. The motorized precision positioners come in a variety of standard and custom versions for any budget and application. They range from low-cost, open-loop stages with stepper motors and lead-screw drive to high-speed, high-accuracy models with linear encoders featuring up to 1-nm resolution. Numerous motion controllers with USB and RS-232 interfacing are available to match positioning mechanics and application requirements. Applications include semiconductor alignment, biotechnology, fiber-optic alignment, and optics research. *Physik Instrumente LP*, 16 Albert Street, Auburn, MA 01501, <http://www.pi-usa.us>

Particle-size analyzer

The new SALD-2300 laser diffraction particle-size analyzer from Shimadzu measures the size and distribution of particles; the particle-size distribution of raw powdered materials is an important quality control element. As measurement needs are expanding in a variety of fields and domains, Shimadzu has extended the measurement range of 30 nm–1000 μ m to a range of 17 nm–2500 μ m and developed an instrument that can easily perform efficient, sophisticated measurements. In the laser diffraction method, a group of particles is exposed to laser light, and the intensity distribution pattern of the resulting diffracted and scattered light is detected and analyzed to find the particles' sizes and the proportion at

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which they are included. With the SALD-2300, samples at a variety of concentrations can be measured without diluting or concentrating them, and continuous measurements can be performed in intervals as short as 1 s. *Shimadzu Scientific Instruments, 7102 Riverwood Drive, Columbia, MD 21046, <http://www.ssi.shimadzu.com>*

SEM for subnanometer imaging

A new series of field-emission scanning electron microscopes from JEOL offers imaging and analysis capabilities that can be customized to performance requirements. The combination of large beam currents with a small probe size at any accelerating voltage allows for the JEOL JSM-7100F series' sub-1-nm imaging capabilities and analytical characterization at the sub-100-nm scale. The microscope delivers 200 nA of beam current to the sample through its in-lens field-emission gun. An aperture angle control lens automatically optimizes small probe current spot size for high-resolution imaging and spot shape for high-beam-current, high-resolution microanalysis. A beam deceleration mode curtails charging on nonconductive specimens such as ceramics, semiconductors, and polymers. *JEOL USA Inc, 11 Dearborn Road, Peabody, MA 01960, <http://www.jeolusa.com>*

Triple isotope analyzer

Los Gatos Research has introduced a triple isotope analyzer for direct simultaneous measurement of $\delta^{17}\text{O}$, $\delta^{18}\text{O}$, and $\delta^2\text{H}$ ratios in liquid water and water vapor samples. The IWA-46EP is capable of automated, continuous, or batch operation. According to the company, the analyzer delivers isotopic sensitivity and precision comparable to those of reference isotope ratio mass spectrometers. With its rugged, compact packaging, it is suitable for remote and airborne operation and for routine laboratory use. The device is based on off-axis integrated cavity-output spectroscopy technology, a cavity-enhanced laser absorption technique that is more rugged and more precise than earlier techniques such as conventional cavity ringdown spectroscopy. It does not require ultraprecise alignment

or subnanometer stability of its optics or a high degree of thermal control. Applications include atmospheric chemistry, water-cycle studies, and medical diagnostics. *Los Gatos Research Inc, 67 East Evelyn Avenue, Mountain View, CA 94041-1529, <http://www.lgrinc.com>*

Optical spectrum analyzers

Thorlabs has released the first product in a planned line of optical spectrum analyzers. While many commonly available OSAs are grating-based monochromators, Thorlabs' version uses a Fourier-transform OSA with a scanning Michelson interferometer configuration. The result is a device that operates as both a full-featured OSA and a high-precision wavelength meter. The new OSA203 features a 1000- to 2500-nm wavelength measurement range, a spectral resolution of 7.5 GHz when used as an OSA, and a wavelength meter resolution of 0.2 pm. All of the OSAs feature an input aperture that accepts fiber coupling with other instruments and is suitable for interfacing with Thorlabs' tunable laser kits, pigtailed laser diodes, and fiber collimators. Thorlabs' OSAs are provided with a laptop computer preloaded with a full software package for acquiring, inspecting, manipulating, and analyzing spectra and interferograms. *Thorlabs, 56 Sparta Avenue, Newton, NJ 07860, <http://www.thorlabs.com>*

Image analysis system

Leica Microsystems has released Tissue IA 2.0 image analysis software that



offers a solution for immunohistochemistry (IHC) biomarker quantification. A major research challenge is

retrieval of quantitative, reproducible data from tissue-based IHC studies. Color separation and multimarker colocalization functionality provide advanced insight and unbiased measurement of multiple antigen immunostaining in bright-field or fluorescent samples. The dual staining capabilities in Tissue IA 2.0 enable researchers to identify cell cohorts at the molecular level. The software has a Web-accessible interface. With high-throughput batch analysis capacity, Tissue IA 2.0 will process whole slides, regions of interest, and tissue microarray cores and automatically integrate analysis results with a user's slides. A built-in upload interface that facilitates integration of algorithms from third-party software solutions provides flexibility to further expand analysis options. *Leica Microsystems Inc, 1700 Leider Lane, Buffalo Grove, IL 60089, <http://www.leica-microsystems.com>*

Protein analysis system

Malvern Instruments has launched a new size exclusion chromatography (SEC) and light-scattering detector package dedicated to protein analysis. The Zetasizer μV with OmniFACE and OmniSEC software offers dual dynamic light-scattering and static light-scattering capabilities. It is a suitable tool for protein applications because it can be used as a standalone detector that can analyze samples in a cuvette and as a fully featured modular chromatography detector. Standalone batch-mode applications include the study of molecular size and formulation stability; SEC detector-mode applications include the measurement of molecular weight, determination of oligomeric state, and detection and quantification of oligomers and aggregates. The absolute nature of the measurement means that no column calibration is required. The Zetasizer μV is available as a complete chromatography system; it can also be added to existing SEC modules. Malvern's OmniFACE provides the necessary connection that enables the Zetasizer μV to be linked into any third-party SEC system and detectors, so that output signals can be used by the OmniSEC software for results calculation. *Malvern Instruments Ltd, Enigma Business Park, Grovetown Road, Malvern, Worcestershire, WR14 1XZ, UK, <http://www.malvern.com>* ■