

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.

Andreas Mandelis

Focus on analytical equipment and diagnostics

Liquid chromatograph-mass spectrometer

The Agilent 6420 triple quadrupole liquid chromatography-mass spectrometry (LC/MS) system is suitable for both routine and complex analyses such as toxicology, environmental, biological, pharmaceutical, and drug testing. It may be operated around the clock in laboratories running a large number of samples. Replacing Agilent's model 6410 triple quadrupole mass spectrometer, the 6420 maintains method and data compatibility with existing 6410 methods and can easily be incorporated into high-productivity laboratories with multiple 6410 systems. It can also be upgraded to the higher-performance 6430 and 6460 instruments as needed. The 6420 supports Agilent's ultrahigh-performance liquid chromatography solutions with the benefits of a complete LC/MS system from a single vendor. *Agilent Technologies Inc, 5301 Stevens Creek Boulevard, Santa Clara, CA 95051, <http://www.agilent.com>*

Gas analyzer for thermal analysis

The new Hiden QGA mass spectrometer addresses the need for a fast-response, multirole gas analysis system that can be adapted to monitor and control a diverse range of thermal reaction systems and processes. Typical application areas include reaction kinetics, catalyst characterization, reduction, and oxidation. The system measures all gas and vapor species with molecular

weights up to 300 amu. It includes external inputs that enable the integration and display of process parameters such as temperature, weight, and pressure with the measurements. A family of dedicated process interfaces and a custom design service for specialized applications provide for direct and optimized coupling to the majority of process systems. For multistream applications, the expanded range of inlet systems enables monitoring of from 4 to 80 gas streams automatically and sequentially in any user-selected sequence. *Hidden Analytical Inc, 37699 Schoolcraft Road, Livonia, MI 48150, <http://www.hiddeninc.com>*

Pressure transducer series

The Omega Engineering PXM309 Metric series has a high static accuracy of 0.25% and a 1% total error band (TEB) over a compensated range of -20 to 85 °C on ranges of 1-700 bar. Ranges from 70 mbar to 3.5 bar are also available with a slightly larger TEB. All units have a five-point NIST-traceable calibration certificate. The all-stainless-steel construction and solid-state reliability make these transducers suitable for most industrial applications and for engine test stands. The PXM309 series



transducers are sealed to an IP65 environmental rating. They are available with three electrical terminations—a 1.5-m 2- or 3-conductor cable, mA or 10-V outputs, respectively, in the case of the PXM309; a mini-DIN connector with mating connector included for the PXM319; and a 4-pin M12 connector for the PXM359. Two outputs are offered, either 0-10 V_{dc} or 4-20 mA. The pressure connection is a standard G 1/4 male metric fitting. *Omega Engineering Inc, One Omega Drive, P.O. Box 4047, Stamford, CT 06907-0047, <http://www.omega.com>*

Multiwavelength meter

The Bristol Instruments 428 series multiwavelength meter simultaneously measures wavelength, power, and optical signal-to-noise ratio (OSNR) in order to fully characterize dense wavelength-division multiplexing components and DWDM transmission systems. According to the company, the model 428 provides high accuracy of ± 0.3 pm to achieve reliable test results; its straightforward operation and rugged design satisfy the needs of both the research scientist and the manufacturing engineer. The 428 series multiwavelength meter combines Michelson interferometer-based technology with fast Fourier transform analysis, which results in the ability to measure the wavelength and power of up to 250 discrete optical signals. In addition, the 428 system can automatically calculate OSNR to > 40 dB. *Bristol Instruments Inc, Suite 101, 7647 Main Street Fishers, Victor, NY 14564-8909, <http://www.bristol-inst.com>*

Hyperspectral imaging system

Bruker's HI 90 imager is a new, high-spatial-resolution, ultrafast, hyperspectral imaging system in the company's remote-sensing product line. It performs remote chemical sensing based on the combination of a Michelson interferometer and a focal-plane-array detector. Each pixel of the array records an interferogram from the field of view that corresponds to it. A spectrum at each pixel is obtained by Fourier transformation and contains the IR signature of the image at each point. The HI 90 system allows for fast identification, quantification, and visualization of potentially hazardous gases from long distances. Due to its array detector, the HI 90 hyperspectral imager can measure all pixels simultaneously up to 1000 times faster than traditional scanning systems



that record the spectra at each pixel sequentially. Applications of the HI 90 include atmospheric and environmental research and industrial quality control. *Bruker Optics Inc, 19 Fortune Drive, Manning Park, Billerica, MA 01821-3991, <http://www.brukeroptics.com>*

Trace gas analyzer

The VeraSpec Trace system provides ionization techniques for pure and general gas analysis in one system. Trace-level analysis of impurities in



pure gases is critical to the development and implementation of semiconductor and other high-tech industrial applications. The VeraSpec Trace can be configured for both electron impact ionization (EI) and atmospheric pressure ionization techniques. The base system utilizes either the closed source electron impact ionization or the reliable DC corona-discharge atmospheric-pressure ionization source for monitoring molecules in the ppb and ppt ranges. The standard EI source has detection limits in the ppb range, and the membrane introduction mass spectrometry can provide sub-ppb detection limits for some components. The VeraSpec Trace system utilizes a 19-mm tri-filter quadrupole mass spectrometer with mass ranges from 1 amu to 4000 amu. *Extrel CMS, LLC, 575 Epsilon Drive, Pittsburgh, PA 15238, <http://extrel.com>*

Magnetic shape-memory alloy

Goodfellow has made available a magnetic shape-memory alloy—nickel-manganese-gallium—that responds to both magnetic fields and temperature, a property that allows for the conversion of magnetic field energy into kinetic energy. Although it is similar in action to piezo-based or magnetostrictive materials, this patented NiMnGa single crystal produces much higher strain outputs, typically 10–100 times as high, and energy density that is 8–50 times as high. This alloy represents a significant alternative to conventional actuators, especially for applications such as aerospace, automotive, and medical compo-

nents, which require a large strain and light weight. When placed in a magnetic field, the NiMnGa single crystal elongates by up to 6%. The shape change is very rapid, with cycle times of up to 1–2 kHz observed and several hundred million cycles achieved while testing fatigue life. *Goodfellow Corporation, 305 High Tech Drive, Oakdale, PA 15071-3911, <http://www.goodfellow.com>*

Nanoscale protein analysis

NanoInk's Nano BioDiscovery division has launched a new instrument system for nanoscale protein analysis and discovery. It is based on NanoInk's patented, tip-based dip-pen nanolithography (DPN) technology, which can create highly reproducible protein arrays over millimeter areas with nanometer precision and then fluorescently image these nanoarrays at high resolution. Components of the NanoArray assay system include the NanoArrayer 3000, the NanoScan 900 scanner, and software for flexible and precise array patterning and intuitive data acquisition and image analysis. Miniaturized and multiplexed NanoArray system assays achieve fg/ml sensitivity with 2 μ l of sample, comparable to or better than the sensitivities of enzyme-linked immunosorbent and bead-based assays that consume 50 μ l of the sample. *NanoInk Inc, Illinois Science + Technology Park, 8025 Lamon Avenue, Skokie, IL 60077, <http://www.nanoink.net>*

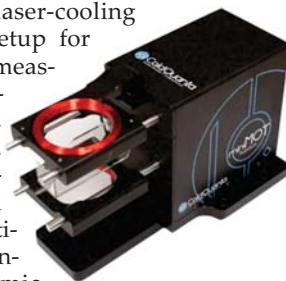
Heavy element quantification

Spectro Analytical Instruments has optimized its XEPOS HE spectrometer for the analysis of medium and heavy elements in laboratories conducting environmental, geological, and waste disposal analysis. According to the company, the new device achieves detection limits that are 5–10 times higher than conventional energy dispersive x-ray fluorescence (ED-XRF) instruments. The Spectro XEPOS HE has a flexible excitation source and uses a stable 50-W end-window tube. A target changer with up to eight polarization and secondary targets allows users to achieve excellent sensitivity and accuracy for an ED-XRF instrument during the analysis of medium and heavy elements. The XEPOS HE is equipped with a large-area silicon drift detector. With the large surface area, the instrument provides

high sensitivities and gives users the choice of measuring a great deal faster or achieving lower detection limits. *Spectro Analytical Instruments GmbH, Boschstrasse 10, 47533 Kleve, Germany, <http://www.spectro.com>*

Magneto-optical trap

In cooperation with ColdQuanta, Topica Photonics now offers the first commercial magneto-optical trap kit. According to the company, an MOT is the most popular laser-cooling and -trapping setup for high precision measurements, fundamental research, and education. The MOT requires a vacuum system with optical access that contains the atomic



species to be trapped and a magnetic quadrupole field. Topica now makes these systems available in a compact setup combining narrow-linewidth, frequency-stabilized Topica lasers—TA pro, DL pro, and DL DFB—spectroscopy modules, and locking electronics. Different configurations can be built by adding a range of available components such as a vacuum system, ion pump, rubidium dispenser, mounted anti-Helmholtz coils, and camera. *Topica Photonics Inc, 1286 Blossom Drive, Victor, NY 14564, <http://www.topica.com>*

High-voltage power supply

McPherson has released a highly regulated, low-noise, continuously adjustable, high-voltage power supply for photometric and spectroscopy applications in industrial and scientific research. The model 7640 high-voltage power supply series is highly regulated and designed for use with photomultiplier tube, channel electron multiplier, and microchannel-type detectors and with other devices requiring a stable source of high voltage. Users can set and deliver high voltage levels with 0.002% regulation at any point between zero and 1 kV at the front panel by means of a precise 10-turn potentiometer and a 4.5-digit LCD. The instrument's rear panel features a scaled analog input for remote control. The model 7640 is the first in a larger series of power supplies delivering maximum

output of -1000, -2000, or ± 5000 V. *McPherson Inc, 7A Stuart Road, Chelmsford, MA 01824-4107, <http://www.mcphersoninc.com>*

Stable super-resolution microscope stages

Physik Instrumente has added two new models to its PInano super-resolution microscope stage series. The new models are equipped with direct-measuring capacitive sensors, which can provide higher linearity and long-term stability than the piezoresistive sensor-equipped stages still available. Capacitive sensors are also less sensitive to noise due to a high-frequency measurement principle, as opposed to the DC-based sensing technique used in piezoresistive sensors. The large aperture accommodates microscopy accessories such as slide holders and petri dish holders. The recessed bottom slide mount allows full rotation of the turret without in-and-out Z motion, so valuable objective lenses are protected from crashing into the stage on turret rotation. Both XY and XYZ stages are available. The low-profile, 20-mm design facilitates integration into inverted microscopes from major manufacturers. *Physik Instrumente LP, 16 Albert Street, Auburn, MA 01501, <http://www.physikinstrumente.com>*

Biomolecular-interaction detection system

Plexera's new PlexArray HT is a high-throughput, label-free, biomolecular-interaction detection system based on surface plasmon resonance. It produces high-quality information on kinetics, affinities, and specificities of reactants. The system includes the PlexArray analyzer for parallel analysis of multiplex detections, including low affinity and small molecule interactions. A serum sample can be measured in 15 min, and thousands of protein interactions can be completed in only 30 min. Patented PlexArray sensor chips feature high array density (> 1000 spots interrogated simultaneously), variable array spot size, and multiple surface chemistries for protein, nucleic acid, small molecule, or live cell immobilization. The customizable microfluidic flow cell, a key feature, reduces sample volume, minimizes sample dispersion, and can

be configured into arrays of arrays allowing simultaneous analysis of multiple samples. *Plexera LLC, 17625 130th Avenue Northeast, Suite 103, Woodinville, WA 98072, <http://www.plexera.com>*

Hybrid mass spectrometer

Thermo Fisher Scientific has introduced the Thermo Scientific Orbitrap Elite, a hybrid mass spectrometer offering resolving power of 240 000. It integrates the company's faster, more sensitive ion trap, the Thermo Scientific Velos Pro, with its new high-field Orbitrap and advanced signal-processing technologies. The system offers a range of fragmentation techniques intended to help users explore and address complex challenges in biomedical applications. The Orbitrap Elite brings together multiple technologies, including new ion-transfer optics that improve ion-beam transmission into the Orbitrap mass analyzer, and a new image current preamplifier. For quantitative proteomics, its higher system speed and sensitivity increase the number of quantifiable peptides when using isobaric labeling methods such as tandem mass tags. *Thermo Fisher Scientific, 81 Wyman Street, Waltham, MA 02454, <http://www.thermofisher.com>*

Gel analysis software

Gel-Pro Analyzer version 6.3 image analysis software from Media Cybernetics extracts valuable qualitative and quantitative information from electrophoretic gels, blots, and colonies. This latest version of Gel-Pro Analyzer includes support for 32- and 64-bit Windows Vista and Windows 7 operating systems. According to the company, the software increases laboratory productivity and efficiency by eliminating the time-consuming steps involved in manually analyzing Southern, Northern, and Western blots, dot and slot blots, and quantitative polymerase chain reactions. Gel-Pro was jointly designed by Media Cybernetics and molecular biologists for intuitive, easy-to-use analysis without compromising the features necessary to achieve accurate results. Images of wet gels, dry gels, photos, or gels on film can be acquired and analyzed automatically. *Media Cybernetics Inc, 4340 East-West Highway, Suite 400, Bethesda, MD 20814-4411, <http://www.mediacy.com>* ■

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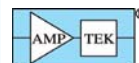
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