

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. To facilitate inquiries about a particular product, a Reader Service Card is attached inside the back cover of the magazine.

Lawrence G. Rubin

Focus on Spectroscopy

Wideband Spectroradiometer

International Light has introduced the RPS900 wideband spectroradiometer, a NIST-traceable instrument that measures from 220 to 1050 nm with 1-nm resolution. It features a 2048-element CCD with proprietary filtering to achieve high speed and sensitivity over the entire range. The sensitivity varies with wavelength, reaching 5 nW/cm²/nm in the visible range and 100 nW/cm²/nm in the UV and near-IR. The RPS900 has a stray-light rejection better than 10⁻³ and provides a capture time better than 25 ms with a user-controlled integration time to 30 ms. A 16-bit conversion enables the resolution of low-level spectra on large backgrounds. The spectroradiometer includes real-time graphic display software with peak-finding tools, time-averaging, FFT smoothing, color analysis, and a USB interface. *International Light Inc., 17 Graf Road, Newburyport, MA 01950, <http://www.intl-light.com>*

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Software for Spectrometers

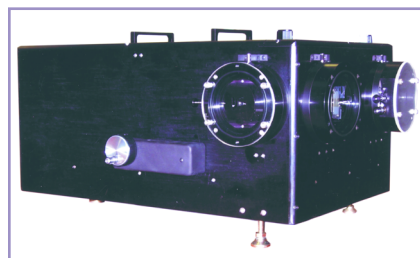
Newport has announced two software modules that enable the company's OSM series minispectrometers to be used for quantitative colorimetry or thin-film thickness measurements. The Color-Analyst module converts spectral data into coordinates for all common color space standards. This allows users to derive the color temperature for a source and provides various mathematical tools for other spectral manipulations. The Layer Thickness Measurement package is designed to work in conjunction with a novel Newport probe to enable accurate measurement of up to three material layers with thicknesses in the range of 0.1–20 μ m. The analysis algorithm calculates the thickness for spectral interference patterns in the visible and near-IR ranges. Both modules are compatible with the OSM-Analyst PC software provided

with OSM instruments. *Newport Corporation, 1791 Deere Avenue, Irvine, CA 92606, <http://www.newport.com>*

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High-Throughput Monochromator

McPherson's model 205 Czerny-Turner monochromator offers a 500-mm focal length with an f/3.2 aperture ratio, a combination that requires a large grating (120 mm $\times$ 150 mm). The 205 reportedly provides the user with the most throughput and fastest aperture in a long-



focal-length instrument. This model incorporates two exit ports; the lateral exit port achieves the best imaging and the axial port delivers best resolution. Two entrance ports are also provided. Many additional gratings are available for operation at f/4.3 or even f/6.9. Grating changes are simplified with the company's SNAP-IN design that allows alignment-free use. The spectral range of the 205 is from 185 nm to 78 μ m when used in air; in a vacuum, the range can be extended to 105 nm, depending on the grating. *McPherson Inc., 7A Stuart Road, Chelmsford, MA 01824, <http://www.mcphersoninc.com>*

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Digital Compact Interferometer

FISBA OPTIK has developed the μ Phase 2 HR, a digital, compact, phase-shifting Twyman-Green interferometer that operates at a wavelength of 632.8 nm. It incorporates a high-resolution (1000 $\times$ 1000 pixels) camera, object-plane focusing ability,

and a variable reflectivity adjustment that dispenses with external pellicles and attenuating elements. The built-in reflectivity selector covers an object reflectivity range of 0.3%–100%, and the instrument's wide field angle makes it easy to capture the whole of the specimen's surface—right out to the edges. The μ Phase 2 HR offers a wide choice of measuring objectives and precision stands. Digital measuring and analysis software includes either μ Shape Basic or μ Shape Professional for the most exacting requirements. *FISBA OPTIK LLC, 3495 Winton Place, Building E, 120, Rochester, NY 14623, <http://www.fisbaoptik.com>*

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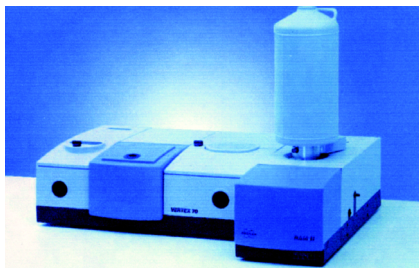
Laser-Induced-Breakdown Spectroscopy

The PORTA-LIBS-2000 spectrometers from StellarNet are portable fiber-optic instruments that use laser-induced-breakdown spectroscopy to allow real-time quantitative identification of trace elements in solids, gases, and liquids. A PORTA-LIBS-2000 comprises an EPP2000 spectrometer integrated with a high-intensity pulsed laser and sample chamber to provide measurements in the 190- to 1000-nm spectral range. The LHR models have double the resolution compared to the LSR standard units with the same grating, but the LSR models have twice the wavelength range. Various models offer a choice of grating range and slit resolution to fit detection requirements. For example, the LSR model VIS4 covers the 400- to 600-nm range with 0.20-nm resolution; the LHR VIS3 is for the 400- to 500-nm range with 0.10-nm resolution. *StellarNet Inc., 14390 Carlson Circle, Tampa, FL 33626, <http://www.stellarnet-inc.com>*

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Raman Module for FT-IR Spectroscopy

Bruker Optics has introduced the RAM II add-on module, a dual-channel

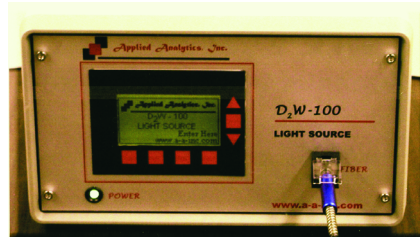


FT-Raman accessory for the company's multirange FT-IR spectrometers, such as the Vertex 70 (see photo). The new module uses the spectrometer's one input and one output port and is equipped with standard 1064-nm laser excitation for highest suppression of fluorescence. Also available are 976- or 785-nm lasers to offer, for example, enhanced Stokes-range or high-temperature FT-Raman capabilities. Switching between the IR and Raman configurations is managed through software control. RAM II's large sample compartment can accommodate an extensive range of prealigned sampling accessories for many types of sample formats, from powders to liquids in vials. The company's OPUS software helps RAM II achieve data collection for complex applications. *Bruker Optics Inc, 19 Fortune Drive, Billerica, MA 01821, <http://www.brukeroptics.com>*

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Fiber-optic Light Source

The D₂W-100 from Applied Analytics is a fiber-optic light source that uses a high-efficiency optical setup to collect the combined flux of deuterium and tungsten sources into a fiber. The output covers a continuous spectrum of 190–2000 nm. Control over the output is achieved by varying the intensity of the tungsten source and turning the individual sources on or off. Up to four different filters can be introduced into the optical path by means of a filter wheel; one position on the wheel is a shutter. The D₂W-100 system's output can be compensated or uncompensated (for the D₂ alpha line). The light source can be controlled via a 7-button membrane keypad and an LCD display, or through an RS232 connection to a remote computer. *Applied Analytics*



Inc, 2 Clock Tower Place, Suite 535, Maynard, MA 01754, <http://www.a-a-inc.com>

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High-Resolution Spectrometer

The Ocean Optics HR4000 is a miniature high-resolution spectrometer with a footprint of 14.5 cm × 10.4 cm. It has a new 3648-element CCD array from Toshiba and achieves an optical resolution to 2.0 nm with a 4-inch focal length. The spectrometer is responsive from 200 to 1100 nm, although both spectral range and optical resolution will depend on the choice of one of 13 grating options and an entrance slit (available in widths from 5 to 200 μm). The HR4000 has a dynamic range of 2.5 × 10⁹ and a signal-to-noise ratio of 2500:1 for a single integration period. Its integrated onboard module has 10 user-programmable digital I/O lines, 13-bit analog input, and 9-bit analog output. The spectrometer operates via RS232 or USB 2.0 communications; the USB port enables full spectral scans into memory every 4 ms. *Ocean Optics Inc, 830 Douglas Avenue, Dunedin, FL 34698, <http://www.oceanoptics.com>*

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THE AH2700A MULTI-FREQUENCY CAPACITANCE/LOSS BRIDGE: ULTRA-PRECISION, AUTOBALANCING, AUTORANGING 27 DISCRETE FREQUENCIES

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- Resolution: 0.8 nF & 0.16 ppm/1kHz; 16 nF & 0.8 ppm/100kHz; 2.1 nF & 0.5 ppm/10kHz
- Temperature Coefficient: 0.035ppm/°C/1kHz; 0.07ppm/°C/100kHz & 10kHz
- Loss down to a dissipation factor of 1.5 × 10⁻⁵ (typ)

Other Features

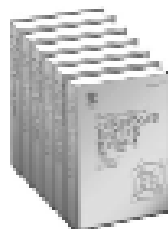
- Analog Output (3 Mhz at 300 down)
- IEEE 488 GPIB and IEEE 1174 serial interfaces
- External DC bias up to 100Volts
- Automatic internal calibration
- NIST or NPL traceable calibration
- Three year warranty

FOR MORE INFORMATION CONTACT:
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Mass Spectrometry Detector

Burle Electro-Optics is offering an improved performance, fast-timing, time-of-flight detector with a 40-mm collection diameter for TOF mass spectrometry. The new detector incorporates small-pore 5- μm extended dynamic range multichannel plate technology that reportedly offers one of the highest channel densities of any available MCP. Its large format and 760-ps pulse width provide levels of mass resolution, dynamic range, and detection sensitivity said to be nearly 10 times that of conventional MCPs. The new detector is housed in the company's Quick-Fit replaceable cartridge; each cartridge includes a Chevron set of two MCPs and a high-voltage transmission grid mounted in a rugged module with a 50-ohm impedance-matched conical anode. *Burle Electro-Optics Inc., Sturbridge Business Park, P.O. Box 1159, Sturbridge, MA 01566-1159, <http://www.burle.com>*

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Diffraction Gratings

HORIBA Jobin Yvon has announced the VGD grating, a holographic ion-etched grating with a continuously

variable groove depth that is produced by simply translating the grating parallel to the groove direction. The variable groove depth enables continuous blaze adjustment when the VGD is illuminated with a narrow beam. HJY has collaborated with the Soleil Synchrotron optical experts to develop the new grating, optimized for use in the extreme UV with synchrotron light sources. A single VGD grating can provide the efficiency properties of several standard gratings. The technology is compatible with silicon, silicon carbide CVD, and fused silica highly polished blanks, holographic recording processes, and ion etching processes. The new gratings are available with a $110 \times 35 \text{ mm}^2$ ruled area that offers a micro-roughness of less than 0.5 nm rms. *HORIBA Jobin Yvon Inc., 3880 Park Avenue, Edison, NJ 08820-3012, <http://www.jobinyvon.com>*

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Fluorescence Microscopy

Carl Zeiss has introduced the Axio Imager, a modular microscope platform for fluorescence microscopy. The instrument's differential interference

contrast provides high contrast and homogeneous illumination. Brilliant darkfield from 2.5 to 100 times oil (ultra-darkfield) can be combined with brightfield in one condenser. The microscope's apochromatic fluorescence beam path gives optimum color correction over the entire wavelength range. Exposure times can be reduced by up to 50% by using fluorescence filters with an improved signal-to-noise ratio; fast, motorized reflector turrets for either 6 or 10 filter modules are available. Axio Imager can be combined with the company's other systems, such as AxioVision, Axio-Cam, and ApoTome. *Carl Zeiss Microimaging Inc., One Zeiss Drive, Thornwood, NY 10594, <http://www.zeiss.com/micro>*

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Atomic Force Microscope

Windsor Scientific has announced the Nanosurf Mobile-S atomic force microscope, which incorporates a built-in SensorGuard that snaps into place to protect the sensitive scanner and cantilever holder during transport. The instrument can measure five channels in parallel and thus opens

HIGH-CURRENT HIGH-VOLTAGE PULSE GENERATORS

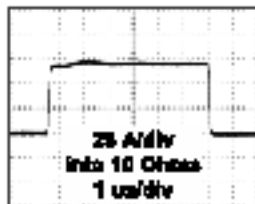
Drive one 18 Ohm load, or five 50 Ohm loads!



The AV02-D series allows the generation of high-voltage (200V to 700V), high-current (20A to 70A) pulses. The unique output connection scheme allows easy connection of a single low impedance load (5 or 10 Ohms) or multiple 50 Ohm loads, without introducing impedance mismatches!

This series is ideal for the burn-in production testing of 50 Ohm devices, such as attenuators, and for testing low impedance devices such as laser diodes.

For data sheets, pricing & application notes, visit www.avtechpulsars.com



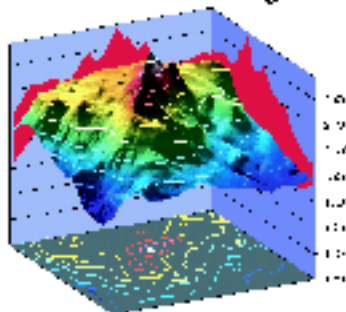
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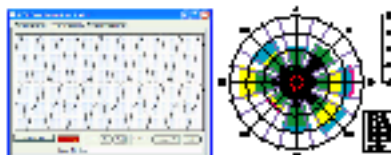
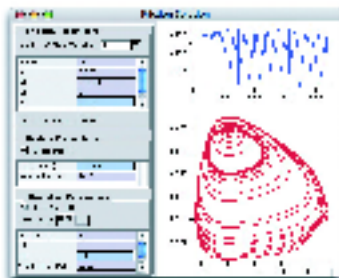
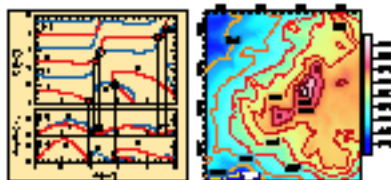
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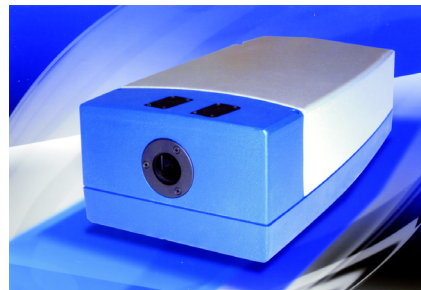
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up many spectroscopy possibilities, including the standard force versus distance plot and graphs of the freely configurable user-signal versus distance or tip voltage. The Mobile-S includes two scan heads, one for imaging at the angstrom level and another for scanning over a larger area (a scan range of more than $100 \mu\text{m} \times 100 \mu\text{m}$ laterally, and $20 \mu\text{m}$ in height). Its electromagnetic scanner keeps the mean error of in-plane linearity to a low 0.6%. *Windsor Scientific Ltd*, 264 Argyll Avenue, Slough Tracking Estate, Slough, SL1 4HE, UK, <http://www.windsor-ltd.co.uk>

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White-Light Interferometer

The TMS-300/320 TopCam interferometer from Polytec is a compact, white-light instrument designed for precision topography and flatness measurements for online parts inspection in production environments. A Michelson interferometer is combined with telecentric imaging, a precision scanning system, and a digital



camera to produce very fast measurements over large fields of view (19-mm diameter). Telecentric lenses allow proper imaging along high, steep edges and within deep, drilled holes. The TMS camera simultaneously acquires 325 000 point interferograms over the entire field of view. The TMS-300 version has a dynamic range of 0.5 mm with a Z resolution of less than 40 nm; the 320 provides a range of 50 mm with an optional high-precision Z of up to 10 nm. *Polytec Inc*, 1342 Bell Avenue, Suite 3-A, Tustin, CA 92780, <http://www.polytec.com>

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Encoded Translation Stages

New Focus, a division of Bookham Inc, has added to its Photonics Tool Chest line the modular model

906X-COM-E encoded translation stages. They incorporate built-in linear optical encoders with thermally matched, hardened, stainless-steel crossed-roller bearings and high-precision reference surfaces. Available in 0.5-in. (model 9066) or 1-in. (9067) travel ranges, the devices deliver an 80-nm resolution and $\pm 3 \mu\text{m}$ accuracy. Custom single- or multiple-axis configurations can be built by combining the stages with other components in the model 906X line of translation stages, angle brackets, and base plates. The 906X modules are fully compatible with the company's model 8751-C closed-loop Intelligent Picomotor drivers and actuators. *New Focus Inc*, 2584 Junction Avenue, San Jose, CA 95134, <http://www.newfocus.com>

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New Literature

The Thorlabs 2005 catalog *Tools of the Trade* includes details on tables and breadboards, nanopositioning stages and packages with 3 to 6 axes, benchtop tunable lasers, laser diode controllers, and polarization measurement and control that can deliver up to one million measurements per second. *Thorlabs Inc*, 435 Route 206 North, Newton, NJ 07860, <http://www.thorlabs.com>

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Keithley Instruments has published its 2005 *Test and Measurement Products* catalog. It offers details and specifications on general-purpose and sensitive sourcing and measurement instruments, DC switching, RF switching and measurements, data acquisition solutions, and semiconductor test systems. *Keithley Instruments Inc*, 28775 Aurora Road, Cleveland, OH 44139-1891, <http://www.keithley.com>

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On the Web

Gage Applied Technologies has launched its new website, with notable improvements in navigation, uniformity, appearance, and general ease-of-use. Information is available on signal-capture products with high performance in the three key dimensions of sampling speed, resolution, and memory. *Gage Applied Technologies*, 1 Provost, Suite 200, Lachine, QC, H8S 4H2, Canada, <http://www.gage-applied.com>

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