

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

High-Energy Spectral Detection

McPherson has introduced the model 234 spectrometers for intercepting and detecting the high-energy vacuum ultraviolet (VUV) and extreme vacuum ultraviolet (EUV) spectra. The model 234/310G is designed for work in the 1- to 100-nm spectral region, and the 234/302 operates in the 50- to 200-nm range. The company's spectrometers in grazing incidence, normal incidence, and Seya-Namioka designs can now be equipped with windowless, back-illuminated CCD detectors for direct detection in the VUV and EUV regions. Rowland circle-grazing instruments and flat-field toroidal versions are ideal for plasma analysis and 13.5-nm source development. Both of the new units are available with gratings of various groove densities, which allow configurations for wide wavelength survey or for high-resolution zoom spectroscopy. *McPherson Inc., 7A Stuart Road, Chelmsford, Massachusetts 01824-4107, <http://www.mcphersoninc.com>*
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Fiberoptic Spectrometer

The new Ocean Optics model HR4000-UV-NIR high-resolution, fiberoptic spectrometer operates over a broad range of 200–1100 nm with 0.5 nm resolution. The modular instrument uses an HC-1 Landis variable-blazed grating, a new 3648-element detector, and a linear-variable order-sorting filter that is attached directly to the detector's window to eliminate second- and third-order effects. The HR4000-UV-NIR features enhanced software-controlled triggering and timing functions, a 10- μ s minimum integration time, and programmable digital and analog outputs. Its Plug-and-Play USB 2.0 device interfaces to a PC via a USB or RS-232 port. The new spectrometer can be combined with the company's light sources, sampling accessories, optical fiber, and soft-

ware to create complete UV-NIR systems. *Ocean Optics Inc., 380 Main Street, Dunedin, Florida 34698, <http://www.oceanoptics.com>*
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Handheld Spectroradiometer

The RPS 200 UV spectroradiometer from International Light is a NIST-traceable, portable instrument for the characterization of UV light sources.



It covers the spectral range between 200 and 500 nm, uses a 256-element CCD array, and provides 5-nm spectral resolution. The small array size is combined with an optical geometry designed to greatly reduce stray light from wavelengths above 500 nm. The instrument features an efficient cosine receptor for irradiance measurements and a 24-degree viewing angle for radiance measurements. This multi-channel spectroradiometer offers a rapid evaluation of UV sources and emissions, typically within 1 to 30 seconds. The NIST-traceable spectral output is in watts per square meter per nanometer; it also provides integrated UVA, UVB, and UVC values. *International Light Inc., 17 Graf Road, Newburyport, Massachusetts 01950, <http://www.intl-light.com>*
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Software for NMR Spectrometers

JEOL USA and Advanced Chemistry Development (ACD/Labs) have announced the integration of JEOL's Delta NMR and ACD/Structure

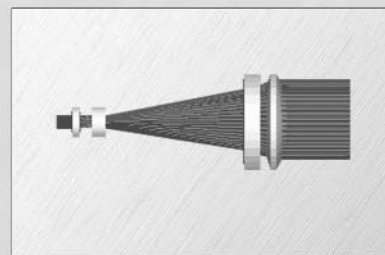


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Elucidator software packages into a combined system. Featured with JEOL's newest generation of high-resolution NMR spectrometers, the ECA and ECX series, Delta software unifies NMR data acquisition, processing, visualization, and output. The ACD/Structure Elucidator enables scientists to determine the chemical structure of unknown compounds using data acquired from their NMR spectrometer or a combination of analytical devices. With the integrated system, the time spent on NMR structure determination is now reportedly reduced from several days to hours or minutes. The claim is that there is now a direct path from the sample in the spectrometer to a solved structure. *JEOL USA Inc, 11 Dearborn Road, Peabody, Massachusetts 01960, <http://www.jeol.com>*

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CCD Detectors for Spectroscopy

Jobin Yvon has developed the Symphony line of CCD detectors dedicated to scientific and spectroscopic applications, in which the optimum choice of a CCD detector will depend on the wavelength range of interest, the anticipated signal or light levels, and the required spectral coverage

and resolution. Those parameters in turn will determine the type of chip (front-illuminated, back-thinned, or UV-enhanced), liquid nitrogen or thermoelectric cooling, the individual pixel size, and the overall active sensor area; chip sizes range from 512×256 to 2048×512 pixels. All Jobin Yvon CCD detectors are controlled by the Symphony family of controllers, which incorporate features such as a 16-bit A/D converter, 20 kHz–1 MHz readout rates, onboard memory storage, and software-selectable gain. *Jobin Yvon Inc, Optical Spectroscopy Division, 3880 Park Avenue, Edison, New Jersey 08820, <http://www.jobinyvon.com>*

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Microscope Spectrophotometer

CRAIC Technologies has released the model QDI 202 microscope spectrophotometer, which can be linked to any microscope fitted with a photoport and a C-mount video adapter. Once attached to the microscope, the system can acquire transmission, reflectance, polarization, and fluorescence microspectra of samples under a micrometer in size. The QDI 202 features a thermoelectrically-cooled detector, digital imaging up to 5 mega-

pixels, UV-visible-NIR spectra (from 350 to 1000 nm) in only one shot, and optional NIR spectroscopy to 1700 nm. The system was designed for diverse applications such as vitritine reflectometry at 546 nm, broadband colorimetric studies of pigments and dyes in textile fibers, the analysis of doped fiber optics, and thin-film thickness measurements. *CRAIC Technologies, 2400 North Lincoln Avenue, Altadena, California 91001, <http://www.microspectra.com>*

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Photodiode Array for Spectroscopy

Sensors Unlimited has introduced the SU1024LE, a 1024-element, linear indium gallium arsenide photodiode array with an extended wavelength range of $2.2 \mu\text{m}$. Spectroscopy is the primary application: The one-inch length of the array is well

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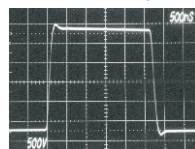
e-Beam Evaporator



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AVRH-1-B

- * 0 to 1000 Volts (to $R \geq 200 \text{ Ohms}$)
- * $\leq 50 \text{ ns}$ rise time
- * 5 kW peak
- * 200 ns to 5.0 μs PW
- * PRF to 1 kHz
- * 0.5 % max duty cycle



AVRH-2-B

- * 0 to 2000 Volts (to $R \geq 1000 \text{ Ohms}$)
- * $\leq 80 \text{ ns}$ rise time
- * 4 kW peak
- * 200 ns to 2.5 μs PW
- * PRF to 1 kHz
- * 0.5 % max duty cycle

AVRH-3-B

- * 0 to 3000 Volts (to $R \geq 1000 \text{ Ohms}$)
- * $\leq 100 \text{ ns}$ rise time
- * 9 kW peak
- * 200 ns to 2.5 μs PW
- * PRF to 1 kHz
- * 0.25 % max duty cycle

* All of the above models include IEEE-488.2 GPIB and RS-232 computer control interfaces. LabView drivers are available at www.avtechpulse.com/labview.

* Visit www.avtechpulse.com/speed for more information about these models, as well as the AVR-8A series of 1000V, 50 Ohm pulse generators.

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matched to existing spectrometers and the array is pin-compatible with previous linear arrays. Images in the short-wave IR (1.0–2.5 μm) provide information not available in the visible and so are useful in quality control of products that either involve the effects of water absorption (with peaks near 1.4 and 1.9 μm) or in thermal imaging at temperatures too low to be seen by silicon CCDs. As a result, spectroscopy applications include plastic and paper sorting, tobacco inspection, and grain sorting and analysis. *Sensors Unlimited Inc, 3490 US Route 1, Building 12, Princeton, New Jersey 08540-5914, <http://www.sensorsinc.com>*

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Imaging Spectrograph

Andor Technology's Shamrock SR-303i is a new imaging spectrograph incorporating a Czerny–Turner optical arrangement, and an interchangeable triple-grating turret with automatic grating identification. With a 303-mm focal length, a 170-nm to 10 μm wavelength range (depending on the grating and detector used), and 0.1-nm wavelength resolution, the Shamrock also features toroidal optics, that enable multitrack spectroscopy. Other specifications include a motorized slit covering a width from 10 μm to 2.5 mm and 68 mm $\times$ 68 mm gratings. The graphical software user interface provides full spectrograph functionality. The Shamrock is available as a pre-aligned detector/spectrometer option or as a standalone spectrograph option with a USB interface to retrofit existing detectors. *Andor Technology, 435 Buckland Road, Rosewood Building, South Windsor, Connecticut 06074, <http://www.andor-tech.com>*

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Far-IR Spectrometer

Bruker Optics is distributing the TeraView, Ltd TPI spectra 1000, a 1000-THz transmission far-IR spec-

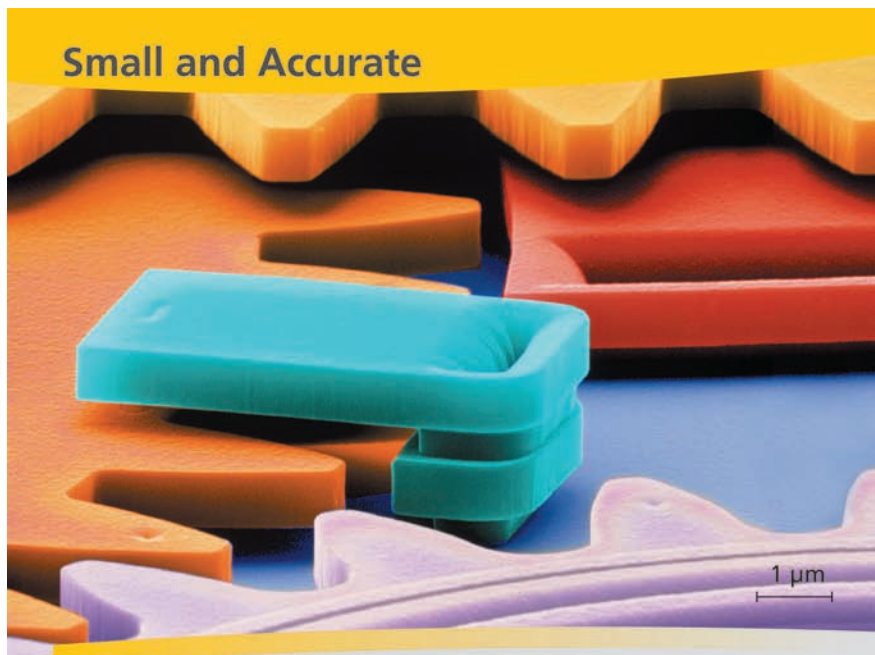
trimeter. Its terahertz source, a point source, laser-gated, photoconductive semiconductor emitter, covers the 40-GHz to 4-THz frequency range (1.3 cm^{-1} –133.3 cm^{-1} in wavenumbers). The nitrogen-purged spectrometer, which incorporates a 16-bit A/D converter, has a higher signal-to-noise ratio at long wavelengths than a Fourier-transform IR instrument. The TPI spectra 1000 operates at room temperature and provides a step-scan mode and a rapid-scan mode in which, for example, single scans can be run at 40 Hz for spectral resolution of

2–3 cm^{-1} . The spectrometer's sample chamber can accommodate a 100-mm $\times$ 80-mm gas cell, and standard liquid cells and sample mounts. *Bruker Optics Inc, 19 Fortune Drive, Manning Park, Billerica, Massachusetts 01821-3991, <http://www.brukeroptics.com>*

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Software for Raman Microscope

WITec GmbH has released new software for its Confocal Raman Microscope CRM 200, a highly sensitive



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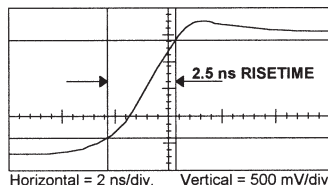
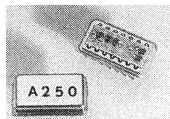


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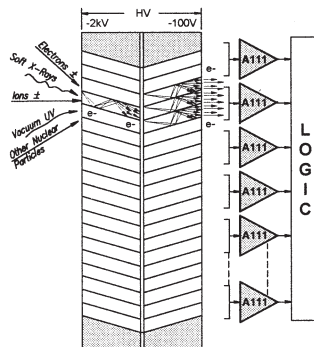
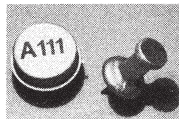
Slew rate: >475 V/μs

APPLICATIONS

- Aerospace
- Portable Instrumentation
- Nuclear Plant Monitoring
- Imaging
- Research Experiments
- Medical & Nuclear Electronics
- Electro-Optical Systems

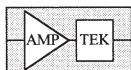
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instrument for Raman microscopy and Raman imaging. The new Scan-Control Spectroscopy Plus software module combines measurement control functions with extensive evaluation and image processing capabilities. All Raman spectra of the measurement are stored, and a complete Raman spectra can be matched to every desired pixel. Using single Raman lines for imaging, the software generates different images of different chemical proportions of the same sample spot. When the module is combined with the CRM 200, resolution down to 200 nm is possible; typical integration times of only a few milliseconds per pixel enable the recording of a complete image in minutes. *WITec Instruments Corp, 101 Tomaras Avenue, Savoy, Illinois 61874, <http://www.witec-instruments.com>*

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Analytical Extensions to Microscopes

Leica Microsystems has announced two analytical extensions to the company's TCS SP2 AOBs confocal microscope systems. The FLIM (fluorescence lifetime imaging) is a tool to measure ion concentration, intracellular signal transduction, membrane potential, and more, using time-correlated single-photon counting technology. The method is available as a D FLIM system using a pulsed 405-nm diode laser or as an MP FLIM system using a multiphoton excitation laser as the excitation source and time reference. The FCS (fluorescence correlation spectroscopy) is a sensitive, cross-correlation detection and analysis system to measure quantitative concentration and diffusion rates down to the single molecule level. *Leica Microsystems Inc, 2345 Waukegan Road, Bannockburn, Illinois 60015, <http://www.leica-microsystems.com>*

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New Literature

Keithley Instruments has published a 432-page *2004 Catalog of Test and Measurement Products*. It is arranged by major product type and application area and includes product selection guides to help readers decide which solution is best for their application and budget. *Keithley Instruments Inc, 28775 Aurora Road, Cleveland, Ohio 44139-1891, <http://www.keithley.com>*

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