

NEW PRODUCTS

The descriptions of the new products listed in this section are based on information supplied to us by the manufacturers, and in some cases by independent sources. 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.

Dual Scanning Probe and Atomic Force UHV Microscope

Park Scientific Instruments has introduced an ultrahigh-vacuum scanning probe microscope. The new AutoProbe UHV AFM-STM incorporates both atomic force and scanning tunneling microscopes that require no optics or alignment, and tips and cantilevers for them that can be interchanged *in situ*. The AutoProbe UHV AFM-STM can image conducting and nonconducting samples prepared in vacuum. The ultrahigh-vacuum system provides a controlled environment that serves to minimize contamination.

The system is designed for studies in physics, chemistry, data-storage media and materials science. The firm expects to announce noncontact atomic force microscopic imaging with this new instrument at the November American Vacuum Society meeting in Orlando, Florida.

Traditional laser-diode optics and mechanical alignment are difficult to achieve in ultrahigh-vacuum atomic force microscopy. Therefore Park has opted for all-electronic cantilevers that dispense with optics and alignment.

The AutoProbe UHV AFM-STM is claimed to achieve atomic resolution in both modes of operation. The system has an interchangeable scanning tip and an atomic-force piezolever cantilever. The piezolever technology has an all-electronic, force-sensing cantilever and tip. The piezolevers use a silicon cantilever structure with a diffused conductive channel. Deflection of the cantilever alters the resistance of the conductive channel. That signal is amplified to drive the AFM feedback system.

The system runs on a 66 MHz, 486 Windows multitasking platform. The high-resolution, dual-axis, inertially-driven translation stage has a

built-in vibration isolation system. The vacuum control system is available with a compact and flexible ultrahigh vacuum chamber. It is compatible with other ambient AutoProbe SPMs. *Park Scientific Instruments, 1171 Borregas Avenue, Sunnyvale, California 94089*

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Fourier-Transform Infrared Spectroscopy of Monolayers

The Bomem MB series of Fourier-transform infrared spectrometers for monolayer studies can routinely measure absorbance down to 20 microabsorbance units, as is required for infrared reflection-absorption spectroscopy. The MB series FT-IR spectrometers are based on a highly stable, permanently aligned proprietary interferometer module with a "wishbone" scan arm. Because the spectrometers can operate in any orientation, they provide considerable flexibility for connecting to ultrahigh-vacuum systems or Langmuir-Blodgett experiments. Bomem can provide assistance in maintaining sensitivity and stability in optical interfacing for *in situ* grazing-reflection work.

The Bomem FT-IR spectrometers can be configured for simultaneous two-channel signal processing. That permits polarization double modulation with simultaneous dc and ac signal recording. *Bomem, 450 St. Jean Baptiste Street, Quebec City, Quebec, Canada G2E 5S5*

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Pulser-Receiver Card for Ultrasonic Materials Testing

Matec Instruments is offering a new ultrasonic pulser-receiver card for IBM PCs and compatibles. With a

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- * Compatible with I.L. Radiometers and Photometers.
- * Can be used with optical filters for spectral studies.

APPLICATIONS:

- * Absorption studies.
- * Pollution detection.
- * Plant Growth studies.
- * Biological studies at air - ocean interface.
- * Underwater communications.
- * Bioluminescence.



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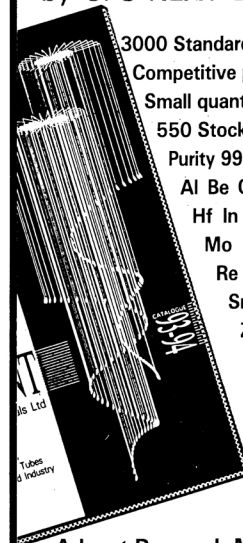
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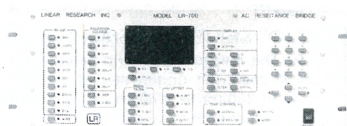
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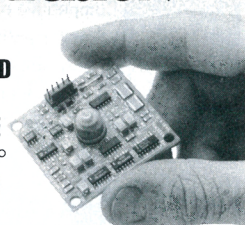
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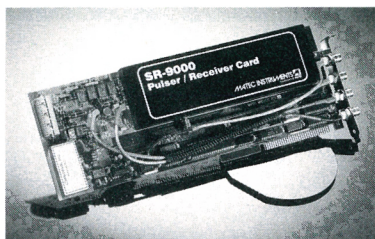
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100-MHz bandwidth and a dynamic range of 63.5 dB, the SR-9000 can nondestructively evaluate electronic, structural and biomedical materials and components for latent defects. The card's utility software lets the user control all functions, including pulser damping, repetition rate, output level, rectification, receiver gain and signal filtering.

When configured with Matec's SR-9010 data-acquisition card and the firm's MI-Scope oscilloscope-emulation software package, the SR-9000 pulser-receiver card provides a low-cost ultrasonic test system for the analysis of material properties. *Matec Instruments, 75 South Street, Hopkinton, Massachusetts 01748*

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Heated Exhaust-Throttling Isolation Valve

MKS Instruments has added a heated exhaust-throttling isolation valve to its line of pressure control products. A proprietary constant-force closure mechanism in the valve compensates for thermal expansion and contraction, we are told, to provide a leak-tight seal even under changing process conditions.

The new Type 654 is available in in-line or right-angle versions. When combined with the firm's Type 655 controller, it provides self-tuning, closed-loop control of process pressures, positive leak-tight shutoff and controlled slow pumpdown. *MKS Instruments, 6 Shattuck Road, Andover, Massachusetts 01810*

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Low-Noise Preamplifier for Signal Processing

EG&G Princeton Applied Research has introduced a new high-performance, low-noise instrumentation preamplifier, the Model 5113. The new unit can serve as a preamplifier for signal processing instruments in applications

as diverse as radioastronomy and audiometry, or for independent use in test and measurement, process control and general-purpose signal amplification. The Model 5113 can be operated by battery or line power, so it can be used in laboratory or field applications.

The unit has ac or dc coupling, single-ended or differential operation, and two switch-selectable values of input impedance. Two integral signal filters can be configured to give high-pass or low-pass modes or, alternatively, a broad-band response from dc to 1 MHz. Gain is variable from 1 to 10⁵. The instrument can be controlled manually or with a computer via an RS232 interface.

All normal operating parameters are shown in an LCD display window so that the operator can see the settings and make rapid adjustments. *EG&G Princeton Applied Research, PO Box 2565, Princeton, New Jersey 08543*

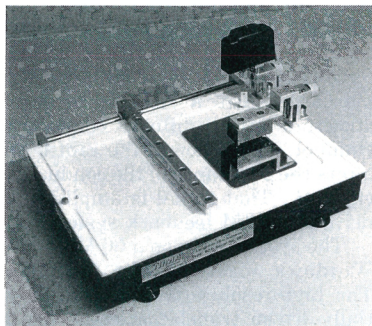
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Depositing Organized Langmuir-Blodgett Thin Films

CTC Technologies has introduced new Langmuir troughs and film balances made by Nima Technology, a British firm. Among the new offerings are miniature troughs adapted for numerous types of spectroscopic and other investigations of monolayer films at air-water interfaces.

Types of studies facilitated by the new small troughs include measurements of ultraviolet, visible and infrared spectra, soft x-ray grazing-angle diffraction in helium, ellipsometry, Brewster-angle and uv fluorescence microscopy and two-dimensional surface pressure potential isotherm measurement.

The photo shows the firm's 600-cm² film balance with a Wilhelmy plate and surface potential sensors. Other film balances or deposition troughs are available in 100- and



NEW PRODUCTS

200-cm² film-covered area sizes. All have full computer control using the latest Nima operating system.

In addition to similar rectangular troughs designed for conventional Langmuir-Blodgett film deposition of multilayers, the firm offers two troughs for the deposition of controlled sequences of two different monolayers. With them, the user can deposit organized multilayer films on suitable substrates. These noncentrosymmetric multilayer films are useful for nonlinear optical film studies, and they have potential applications in microelectronics. *CTC Technologies, 7925-A North Oracle Road, Suite 364, Tucson, Arizona 86704*

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Control Software for Multilayer Film Deposition

The new DCM-100 deposition control manager from Maxtek is a comprehensive software package that runs on most IBM-compatible personal computers. The DCM-100 expands the capabilities of current deposition controllers, we are told. It interfaces through the controller's RS232 port.

Originally designed for managing multilayer optical-film deposition, this program simplifies entry, execution and analysis of complex deposition sequences. The Windows-based user interface provides fast setup and extensive data logging for statistical process control and troubleshooting. All deposition processes are stored in libraries for later use or archiving. Processes are easily created or altered.

The DCM-100 can set up and store hundreds of deposition processes for recall. It provides an extensive film-parameter library and an additional user-definable library for commonly used films. It also increases the number of film layers allowed in a process to a thousand. *Maxtek, 2908 Oregon Court, Torrance, California 90503-2683*

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Inexpensive Photodiode Amplifier

Centronic sells its new CA-100 photodiode amplifier for \$675. The device amplifies low light signals from Centronic detectors and converts them into voltages that can be used to drive oscilloscopes or other voltage-sensing equipment.

This compact amplifier

(6"×2.6"×5.3") generates ± 2 volts from 8 gain settings, ranging from 10^3 to 10^{10} volts per amp. The input photocurrent can vary from 200 pA (full scale) to 2 mA. In the normal current-meter mode, the CA-100 displays the photocurrent directly onto its front panel.

The unit can also be operated in an optical-power mode, in which the calibration knob sets the amplifier to a known optical power and the LCD display presents the optical power directly. An offset adjusting knob lets the user null out room light and photodetector leakage current. *Centronic, 2088 Anchor Court, Anchor Business Park, Newbury Park, California 91320*

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Real-Time Spectral Analysis by Optical Processing

Photonic Systems has developed a new type of spectrum analyzer using optical signal processing technology that provides real-time wideband signal analysis. Conventional electronic spectrum analyzers, we are told, cannot perform frequency-domain analysis in real-time. The new instruments, Models AOS-1000 and AOS-1000×4, use acousto-optic Bragg-cell technology to measure instantaneous rf power spectral density.

The AOS-1000 operates over a 1-GHz instantaneous frequency range, and the AOS-1000×4 operates over a 4-GHz range using 4 separate 1-GHz bandwidth channels. Each system has a frequency resolution of 1 MHz. Photonic systems claims to be the first company to offer the parallel-processing power of optical signal processing in a signal analysis instrument.

The new spectrum analyzers use a laser diode to illuminate an acousto-optic Bragg cell that converts time-varying electronic signals to spatially varying acoustic waves in a transparent optical crystal. The laser light diffracted by the Bragg cell is focused onto a photodetector array. The optical diffraction pattern represents the instantaneous power spectrum of the electronic signal. The combination of an acousto-optic Bragg cell and a photodetector array effectively creates a parallel-channel frequency filter bank for the analysis of short or frequency-hopping signals that might be missed by conventional swept-frequency spectrum analyzers. *Photonics Systems, 1800 Penn Street, Suite 4B, Melbourne, Florida 32901*

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