# 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.

## Scanning tunneling microscope system

Digital Instruments' Nanoscope I is a complete scanning tunneling microscope system capable of producing atomic-resolution topographic images of metal and semiconductor surfaces. The head is a rigid single-piezo design that can operate at high scan rates. The tip is brought within tunneling distance of the sample in 20 seconds by a stepper motor controlled by the electronics. The sample is held in a horizontal position to allow liquids to be placed on it during operation. The range of horizontal scanning of the tip is from 1 Å to 1 micron.

Tunneling to the sample is from Pt–Ir atomic-resolution tips also manufactured by Digital Instruments. The tips are mechanically formed and need no conditioning to obtain atomic resolution. The electronics of the system are integrated into a single package, and the image is produced on a storage oscilloscope included with the system. A sample of the output, showing atoms on the surface of graphite, is shown in the photo. One sees all six carbon atoms in the graphite ring. The Nanoscope I system sells for $25 000 and the tips sell for $10 each. *Digital Instruments*, 5901 *Encina Road, Building C5, Goleta, California* 93117
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## Portable microfocus source producing 70-keV rays

The x-ray tube division of Kevex offers a new microfocus portable x-ray source capable of producing a 10-micron focal spot. The self-contained package, measuring 11″×4″×3″, uses no high-voltage cable or connectors. It produces x rays up to 70 keV at 100 $\mu$A from a 12-V dc source. The continuous output is controlled by solid-state components, and both current and voltage are adjustable by remote control.

The microfocus portable x-ray source can be used for radiographic or real-time inspection of components such as semiconductors, printed circuit boards, ceramics, switches, or any application requiring a high-resolution portable x-ray source. The system incorporates protection against electron beam and filament overcurrents. *Kevex Corporation, X-Ray Tube Division, 320 El Pueblo Road, Scotts Valley, California* 95066
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## Linear translation table for heavy-duty applications

A new series of heavy-duty linear translation tables from Ambrit provides load capabilities up to 820 kg and travel ranges up to 108 cm. Accuracy is claimed to be a part in $10^4$, with bidirectional repeatability of $\pm 1\mu$m. The Ambrit Series 200 linear translation tables all employ rolling-element linear motion bearings that provide constant support and high lateral stability regardless of load position. Such bearings are claimed to provide 13 times more load-carrying capacity and longer bearing life than conventional point-contact systems.

The ways, linear bearings, ballscrew drives and motors are protected by standard bellows-style covers that al-

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low the tables to be used in adverse environments. To save space, the drive motors are contained within the table structure. Integral structural webbing and the resulting frame stiffness provide high load capacities without compromising mounting flexibility. One does not need second supports or granite bases. Tables can be mounted one on top of each other to provide *xy* and *xyz* configurations. Compatible tilt and rotary stages are also available. *Ambrit*, 135 *Main Street*, *North Reading*, *Massachusetts* 01864

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## Magneto-optic test system for soft magnetic materials

LDJ Electronics has introduced the Model 4000S magneto-optic test system. The instrument measures the magneto-optic properties of soft magnetic materials by means of the Kerr effect. Helmholtz coils apply an magnetic field to the test sample, and the system's laser optics detect the resulting Kerr rotation. Applications include testing materials used in recording heads or testing small areas—down to 2 microns in spot size.

The material to be tested can have any size or shape, provided it exhibits a flat, highly polished surface. The Model 4000S test system measures the longitudinal or transverse Kerr effect, with hysteresis curves displayed on an oscilloscope or plotted on an *xy* recorder. Measured magnetic parameters are displayed on digital panel meters. *LDJ Electronics*, 2200 *Stephenson Highway*, *P. O. Box* 219, *Troy*, *Michigan* 48099

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## Miniature nuclear CdTe radiation sensors

Radiation Monitoring Devices offers a line of highly sensitive, rugged, miniature cadmium telluride nuclear radiation detectors. The CdTe detectors are claimed to be more sensitive to low to mid-keV gamma radiation than scintillation detectors of similar size, and they achieve this sensitivity without the use of photomultiplier tubes.

The radiation detectors range in size from cubes as small as 2 mm on a side to wafers 16 mm in diameter. They are available in standard detector housings or in custom housings specified by the user. Applications include nuclear power plant effluent monitoring systems (both air and liquid), small medical probes to pinpoint tissue that has absorbed a previously injected radiopharmaceutical, and industrial position-sensing systems. *Radiation Monitoring Devices*, 44 *Hunt Street*, *Watertown*, *Massachusetts* 02172

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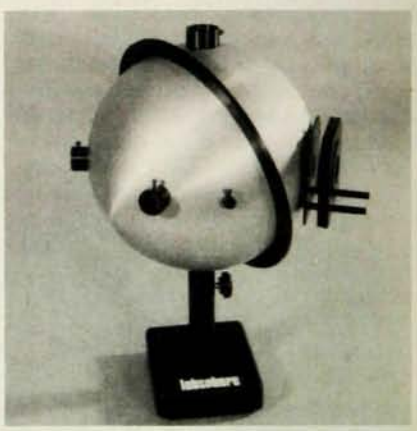
## Optical integrating sphere assembly with double beam

Labsphere has introduced a new product for measuring diffuse, spectral and total reflectance as well as backscatter and transmittance—the ISA-080-RT integrating sphere assembly. Integrating spheres, we are told, are the recommended method for reflectance measurements. The ISA-080-RT assembly provides double-beam geometry to minimize error, and the sphere coating



has high spectral reflectance and near-perfect diffuse reflectance, for a usable wavelength range of 200–2500 nm.

The assembly is rod-mounted for use with lab rail equipment or with its own base. A light trap is provided for measurements of diffuse reflectance, and a port plug is provided for total reflectance measurements. Sample and reference holders accommodate samples of various sizes. Options include a reflectance standards set, detector assembly and a photometer–radiometer. *Labsphere*, *P. O. Box* 70, *North Sutton*, *New Hampshire* 03260

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## Six-inch proximity-focused image diode

ITT has announced a proximity-focused image diode with a useful aperture diameter of 15.2 cm, designed for x-ray imaging applications. The Model F4158 tube has fiber input and output windows and features an S20 photocathode and P20 phosphor. The resolution is 40 lines/mm and the luminous

gain is 35 when the diode is operated at 5 kV. The preliminary gain ranges from 20 to 100 for an applied voltage of 4 kV to 8 kV. The tube is 19.8 cm in diameter and 3.0 cm long. *ITT Electro-optical Products Division, 3700 East Pontiac Street, P. O. Box 3700, Fort Wayne, Indiana 46801*

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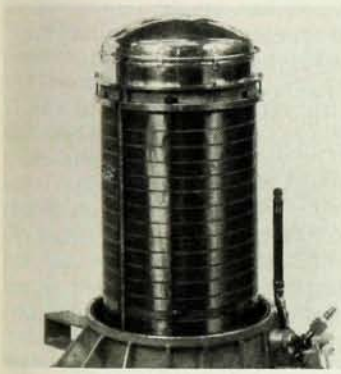
## Rocket-borne helium cryostats with improved capacity

Janis Research has announced the introduction of a test-qualified rocket-borne supercritical helium flight cryostat with a higher cryogen-to-package volume ratio than has been available previously. This substantially greater cryogen capacity is the result of a new shielding approach, in which the radiation shield is an integral part of the structural support. This support structure relies exclusively upon mechanical (welded and bolted) joints, and is said to be simpler in design than most



others. The cooling power of the vent-line gas is conducted in a controlled manner throughout the length and circumference of the radiation shield. The result, we are told, is a superior hold time with negligible weight penalty.

The simpler design, along with technology developed during actual flight qualification testing, permits faster fabrication schedules. The basic cryostat can be configured for purposes including optical cold stations, instrument cooling, flight magnet systems and meeting cryopumping requirements. *Janis Research, 2 Jewel Drive, P. O. Box 696, Wilmington, Massachusetts* 01887

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## Optical coating systems for substrates up to 1.3 m in size

Balzers offers a complete family of optical coating systems with standard substrate holders ranging from 455 mm up to 1360 mm.

These Balzers high-vacuum process systems can also be custom built up to 4 m. They can be configured, we are told, for virtually all optical coating requirements, and they can be equipped with manual or automatic controllers with quartz crystal and optical monitors.

The Balzers high-vacuum process systems incorporate fully automatic diffusion or cryogenic pumping systems with dual vacuum monitoring and safety interlocks. Accessories include electron beam guns with a wide range of crucible sizes, resistance sources, various substrate holders, heaters, gas inlet systems and glow discharges. *Balzers, 8 Sagamore Park Road, Hudson, New Hampshire* 03051

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## Photomultipliers for low light levels

Thorn EMI has introduced two new photomultipliers, 30 mm in diameter, with fast rise times. The 9124 and 9127 tubes are designed for low-light-level detection, particularly in high-energy physics, scintillation counting, spectrometry and photometry.

The photomultipliers are equipped with large input dynodes and linear focused multiplier sections. The 9124 has CsSb dynodes and its response is linear within 2% for currents up to 40 mA; the 9127 has BeCu dynodes and features the same linearity for currents up to 150 mA. The gain of the tubes is $10^6$; at this gain the dark current is 0.2 nA. The single-electron response is typically 2:1 peak to valley. The 9124 is virtually free of rate effects, we are told, and the 9127 shifts its gain less than 1% from 0 to 5 $\mu$A. *Thorn EMI Gencom, 23 Madison Road, Fairfield, New Jersey 07006*

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## Polarization-preserving optical fiber

York Ventures & Special Optical Products has made available optical fiber for 1550 nm that preserves polarization. The beat length (measured at 633 nm) of this fiber is typically 1.3 mm (less than 2 mm is guaranteed) and the attenuation is less than 2 dB/km. The typical polarization cross coupling (or extinction ratio) is $-20$ dB over 1 km. The fiber cladding is 125 $\mu$m thick. *York Ventures & Special Optical Products, York House, School Lane, Chandler's Ford, Hampshire SO5 3DG, England* □

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