

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.

Cryogenic Temperature Indicator And Controller

Scientific Instruments Inc has introduced a new cryogenic temperature indicator and controller—the Model 9650. This microprocessor-based controller offers dual-sensor capability and multi-set-point programming. It comes with an RS232 or IEEE-488 interface. A 16-character, backlit liquid-crystal module displays temperature, set point, heater output and other relevant parameters.

The Model 9650 is provided with signal-conditioning cards that can be



used with available silicon diode and chromel-gold thermocouple sensors as well as sensors made of other metals or semiconductors. *Scientific Instruments, 4400 West Tiffany Drive, Mangonia Park, West Palm Beach, Florida 33407*

Circle number 140 on Reader Service Card

CaNdAlO₄ Crystal Substrates for Superconducting Film

Superconix is offering CaNdAlO₄ crystal substrates for superconducting thin films. This new CaNdAlO₄ crystal has the same structure as K₂NiF₄, with no structural phase transitions. The CaNdAlO₄ crystals have a high-frequency dielectric constant of approximately 20 and a loss tangent of 2.4×10^{-3} .

The lattice constants for these new crystals are $a = 3.688 \text{ \AA}$ and $c = 12.15 \text{ \AA}$. The crystals in stock have (001) orientation. Superconix will also continue to sell LaGaO₃ crystal substrates. Superconix's product line includes crystal and melt-cast samples of Y₁Ba₂Cu₃O_x, Bi₂Ca₂Sr₂Cu₂O_x, CuO, Cu₂O, and long, thin superconducting crystals of proprietary composition. *Superconix, 261 East 5th Street, Saint Paul, Minnesota 55101*

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Scanning-Tunneling and Force Microscopy in Air and Vacuum

Park Scientific is offering several new scanning-tunneling and scanning-force microscopy systems: (1) an ambient scanning-tunneling microscope for operation in air; (2) an ambient scanning-force microscope for ultrahigh-resolution microscopy of nonconducting surfaces; (3) a combined ambient STM/SFM with shared microscope base; and (4) an integrated ultrahigh-vacuum STM system.

The ambient STM offers high-precision scanning-tunneling microscopy over a large sample area. It consists of a head, microscope base, control electronics and an HP 340C + graphics workstation. The new microscope base is common to both the STM and SFM. Therefore one can obtain images over a large area with both fine and repeatable position control. The system includes a piezoelectric tube scanner that permits image sizes up to 5 microns by 5 microns, and a coarse x-y translation stage lets one move the field of view 5 mm in both directions. Coarse sample approach is accomplished with a fine-thread screw, and the automatic sample approach uses a stepper motor. A monocular optical microscope with $120\times$ long working distance is also included.

Here's Why . . .

the NEW High-multiplicity experiments will use GAMMA-X® Detectors

A new generation of exciting experiments is coming on line: EUROGRAM (Anglo-French collaboration), GASP (Italy), and GAMMASPHERE (USA).

EG&G ORTEC is already delivering, in special cryostats, prototype units measuring **under 2 keV — with 70% efficiency.**

This is what the directors of these large projects can expect from their choice of the GAMMA-X detector . . .

- The highest p/C ratios, the best possible resolution and peak-shape specifications (even at FW.02M), thanks to the **world's best germanium crystals**, and the most advanced manufacturing techniques.
- The advantage of having a crystal — for each Ge detector — custom grown in the EG&G ORTEC crystal laboratory
- On-time delivery of detectors that exceed specifications
- The ability to meet the challenge of difficult, special mechanical design requirements
- Convenient neutron-damage repair capability inside each cryostat — no need to return any detector to the factory for repair
- Quality features that do not appear in anyone's specifications:

Reliability — Advanced surface passivation and modern implantation technique

Uniform Electric Field — Deep central contact in a perfectly-ground cylindrical crystal, with "bulletized front corners"



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Harvard

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This highly successful manual has served for nearly two decades as the authoritative guide to the safe use of radiation sources. Revised and updated, this third edition discusses the new Nuclear Regulatory Commission regulations that will go into effect in 1991 and will enable the reader to learn self-protection and the protection of others and to understand and comply with all regulations for radiation use.
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ed. The STM head is designed to provide exceptionally good tip and sample visibility with the optional 1000 $\times$ long working distance optical microscope. This high-power microscope has a CCD camera, a video monitor and a precision x-y table. This allows precise and repeatable placement of the STM tip. The central control unit includes hardware-based sample slope correction, rotatable scan direction and a gain selector that optimizes the A/D resolution for different scan sizes. It has two 18-bit D/A converters for thermal-drift compensation.

The new ambient scanning-force microscope has the same microscope base, software and central control unit electronics as the STM. The key difference between the two is the physical phenomenon that provides the image. The SFM can do ultra-high-resolution microscopy on non-conducting surfaces. The SFM head uses an optical deflection sensing mechanism and force-sensing cantilevers to detect small differences in the repulsive force between the tip and the sample surface. The SFM control module lets the user set working forces ranging from 10^{-6} to 10^{-8} N in air. A liquid cell is also available.
Park Scientific Instruments, 476 Ellis Street, Mountain View, California 94043.

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Diode Array for Spectrophotometry from UV to NIR

Oriel has introduced Instaspec 1B, an inexpensive, general-purpose diode array system for the rapid detection of linear images and spectra from the ultraviolet to the near infrared.

When used with Multispec, Oriel's miniature spectrograph, this new system can replace traditional scanning-monochromator systems. It can acquire entire spectra in as little as 20 ms. The control software will run on XT, AT and 386-type computers. It comes with a full on-line 150-page manual and comprehensive graphics and data manipulation routines.

Instaspec 1B can trigger, and be triggered by, external instruments via TTL signals. The auto-trigger mode can capture spectra of random pulsed events, such as laser pulses or lightning automatically, without any need for electrical synchronization. Full software support is included for linear imaging, absorbance and reflectance spectroscopy, as well as calibrated radiometric measurements.
Oriel Corporation, 250 Long Beach Boulevard, Stratford, Connecticut 06497.

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AC Susceptometer for Characterizing Superconductors

Phasetrack Instruments is offering researchers in superconductivity its new System 102 ac susceptometer. The manufacturer stresses the relatively low cost of this instrument—less than \$40 000. The company describes the System 102 as "a high-performance magnetic susceptometer that distinguishes itself in the speed, thoroughness and accuracy of its superconductor characterization." By way of demonstration, Phasetrack Instruments is offering to measure evaluation samples free of charge for runs down to 65 K, or down to 4 K for a nominal charge.

The System 102 employs a self-inductance technique that is claimed to provide low noise, good stability, a settling time under 50 msec and a measurement sensitivity of 10^6 for volume susceptibility. The fast thermal response of the cryostat lets the user collect a complete family of characterization curves for high- T_c superconductors in under 30 minutes, we are told. The cryostat has a temperature range from 4 to 350 K, a low thermal mass, a sensor maintained at constant temperature and a vacuum-capable sample chamber. It admits sample sizes up to 7mm diameter by 14mm length.

The data-acquisition system is menu driven. Real-time color graphics allow constant monitoring of the progress of the run. Subsequent analysis includes calculations of the criti-

cal temperature and screening current, T_c and J_s , widths of the loss peaks and the susceptibility transitions, and polar plots of the two complex susceptibility components. *Phasetrack Instruments, 2251 Park Avenue, Santa Clara, California 95050.*

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Bus Controller for CCD Cameras

The new Model VME200 from Photometrics is a single-board VME bus controller for the firm's 200 digital CCD cameras. The VME200 is capable of full camera control and image acquisition for all Photometrics CCDs. The firm currently supports CCDs with resolutions from 512×512 up to $2K \times 2K$. Digitized data up to 16 bits per pixel are transferred directly into host memory. The



VME200 obviates external interfaces, and the host has full control of all CCD readout modes, including fast subarray readout and binning.

The VME200 includes a model device driver and a software package for camera control and image acquisition for the Sun 3/4 computer. Applications software from a variety of firms is available for image processing and analysis on Sun, Silicon Graphics and other VME computers. *Photometrics, 2010 North Forbes Boulevard, Tucson, Arizona 85745.*

Circle number 145 on Reader Service Card

CCD Detectors Intensified by Microchannel Plates

Princeton Instruments has introduced a new line of proximity-focused CCD detectors intensified by means of microchannel plates. Their spectral response can be tailored within a range of 120 to 930 nm. The high sensitivity of these detectors (40–100 counts per photoelectron), their low

readout-dark-charge noise ratio (less than 1.3 counts/pixel) and the extremely linear proprietary phosphor of the intensifier, we are told, offer true single-photoelectron detection with a dynamic range of 16 000 to 1. The gating speed of these MCP-intensified detectors can be varied from 5 ns to 6 ms.

Princeton has also introduced a new near-infrared diode array detector, Model INGAS-256, which operates with all of the firm's equipment and software. The detector consists of an InGaAs array of 256 diodes that provides a 12.8-mm focal-plane coverage with responsivity in the wavelength range from 0.8 to 1.7 microns. The array is thermoelectrically cooled from 0° to -65°C to minimize dark charge. *Princeton Instruments, 3660 Quakerbridge Road, Trenton, New Jersey 08619.*

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Positioning Optical Components with Damped Rods

Melles Griot has introduced its Stablerod system, a damped-rod system for the positioning of optical components. This is a modular system of over 80 components, consisting of the rods, carriers, laser holders, mirror holders, beam steerers and adjustable-height platforms. The system is designed to be interchangeable with components from other firms.

Rods up to 24 inches long are available for users requiring a longer positioning range. When positioning larger and heavier components, the user can have increased stability by choosing thicker rods (1.5-in diameter) with internal vibration damping. This should be particularly helpful for holographic facilities. *Melles Griot, 1770 Kettering Street, Irvine, California 92714.*

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New Literature

Pumping—A six-page brochure from Alcatel describes two oil-free Drytel pumping systems incorporating Alcatel's proprietary molecular-drag design to produce vacuums down to 10^{-6} mbar without LN_2 or traps, and with totally oil-free operation. Drytel oil-free pumping systems are intended for applications requiring low ultimate pressure and clean, oil-free pumping. *Alcatel Vacuum Products, 40 Pond Park, Hingham, Massachusetts 02043.*

Why

have these 16 organizations used 300 GAMMA-X[®] detectors from EG&G ORTEC?

The first generation of Spin Spectrometers resulted in procurement of over 300 GAMMA-X Ge detectors from EG&G ORTEC. The 16 facilities acquiring these detectors were:

AECL Chalk River Laboratories
Argonne National Laboratory
Catania Laboratories
Daresbury Laboratories
KFA Jülich
Lawrence Berkeley Laboratory
Legnaro National Laboratories
Max Planck Institute
Niels Bohr Institute
Oak Ridge National Laboratory
State University of New York
Delhi Nuclear Science Center
University of Florence
University of Hiroshima
University of Pittsburgh
Yale University

In fact, well over **4 out of every 5** Ge detectors in spin spectroscopy arrays worldwide have been ordered from one company...

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