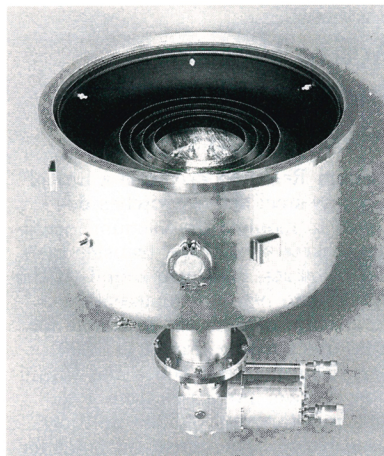


NEW PRODUCTS

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.

500-mm Cryogenic Pump for Sputtering

Balzers's 500-millimeter Kelvac 501ZHP cryopump is designed to function in high vacuum. It has the capacity to pump 12 500 standard liters (equivalent to about 550 moles) of argon gas at a rate of 30 millibar-liters per second. When driven by a



suitable cryogenic cooler, such as Balzers's Kelcool 130, the Kelvac cools to 20 K in 85 minutes. The pump is said to be suitable for large sputtering applications. *Balzers, 8 Sagamore Park Road, Hudson, New Hampshire 03051*

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80-120-Kelvin Mechanical Refrigerator

APD Cryogenics's Cryotiger I is a compact mechanical refrigeration system for cooling to temperatures from 80 to 120 K. The system consists of

a closed-cycle cryostat, an air-cooled compressor and two 10-foot gas-transfer lines with a 9" minimum bend radius. The transfer lines are fitted with self-sealing refrigerant couplings. The cryostat supplies 2 watts of cooling power at 82 K. The entire system functions in the ambient temperature range of 10-35 °C and it measures 17.5" x 14.0" x 12.25". The Cryotiger is expected to find applications in x-ray detection, Fourier-transform spectroscopy, chemical detection and high-temperature superconductivity studies. *APD Cryogenics, 1833 Vultee Street, Allentown, Pennsylvania 18103-4783*

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Low-Temperature Atomic Force Microscopy Tool Kit

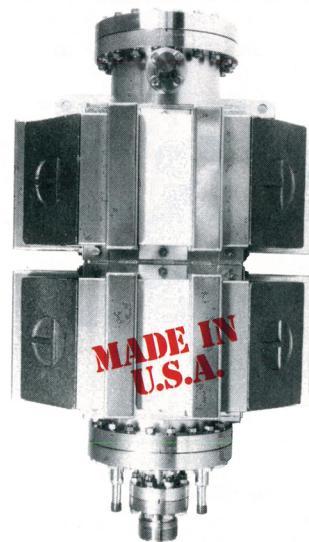
Park Scientific Instruments has released a low-temperature accessory for its Autoprobe atomic force microscope. The accessory includes scanner components, preamplifiers and schematics to allow the user to adapt the Autoprobe for studies at temperatures as low as 6 K. The low-temperature Autoprobe is said to achieve atomic resolution and could be used in surface science and superconductivity studies. *Park Scientific Instruments, 1171 Borregas Avenue, Sunnyvale, California 94089*

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Cryogenic Liquid Level Instruments

The Model 184, 185 and 186 cryogenic liquid level instruments from American Magnetics are designed to

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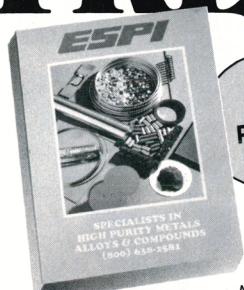


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continuously indicate the level of cryogenic liquids, including nitrogen, hydrogen, oxygen, carbon dioxide, argon, neon and natural gas. All three models read liquid levels with $\pm 0.1\%$ accuracy, and include a four-digit LED display, nonvolatile read-only memory, timer circuitry and a low-line-voltage detector. In addition, the Model 185 provides high and low alarm set points, an audible alarm, rear-panel alarm relay outputs and front-panel LED warning indicators. The Model 186 can automatically control the liquid level. Additional options include a 0–1-volt recorder output, 4–20-milliamperes transmission output and RS-232C and IEEE-488 interfaces, which allow the instruments to be read and controlled by computer. *American Magnet-ics, PO Box 2509, Oak Ridge, Tennessee 37831-2509*

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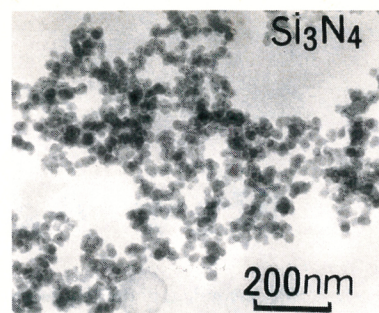
Windows-Based Cryogenic Control Software

Cryo Industries's Auto Control software allows the user to run a Conductus LTC10 or other cryogenic temperature controller from an IBM-compatible personal computer. Using the computer's mouse, one can display and change system parameters and write control routines using a point-and-click visual programming language. Data can be graphed automatically, and the graphs can be edited, stored and printed. Because Auto Control is compatible with Windows's dynamic data exchange protocol, data can be transferred in real time to other Windows applications. With a modem that supports DDE, it is possible to run experiments remotely. Auto Control requires a computer equipped with a 386 or higher processor, at least 4 megabytes of memory, a VGA video display and a mouse. *Cryo Industries of America, 11 Industrial Way, Atkinson, New Hampshire 03811*

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Carbide and Nitride Nanophase Ceramic Powders

Marketch International has added five new nanophase ceramic powders to its inventory: Si_3N_4 , SiC , B_4C , SiO_2 and a silicon-nitride-carbide composite. The nanophase materials



have a typical particle diameter of 20 nanometers and a surface area of 109 m^2 per gram. The large surface area of nanophase materials makes them very reactive and gives them novel mechanical, thermal and electrical properties. Ceramics manufactured from nanophase materials are often more ductile and flexible during forming than are conventional ceramics. The new materials are expected to find applications in electronics and micromachines. *Marketch International, 5869 Beacon Street, Pittsburgh, Pennsylvania 15219*

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Active Vacuum Switches with Alarm Relays

Vacuum Research produces a line of stainless-steel active switches designed to monitor the vacuum insulation jackets on dewars, transfer lines and cryostats; an alarm sounds if the boil-off rate becomes unacceptable. Diaphragm sensors are available for pressures ranging from 1 to 1500 torr. Thermocouple tubes and Pirani sensors cover pressures from 1 to 1000 millitorr and 3–5000 millitorr, respectively. The alarm set point for the switch can be adjusted within these ranges.

Each switch measures $2.25'' \times 2.6'' \times 1.3''$ (or $2.25'' \times 2.6'' \times 18''$ for diaphragm sensors) and operates on 200 milliamperes from a 12-volt dc power supply, which is included with the switch. *Vacuum Research, 2401 Smallman Street, Pittsburgh, Pennsylvania 15222*

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Compact Cryogenic Compressors

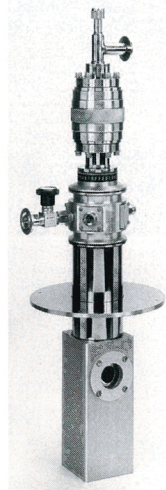
Because Leybold's RW4000 and RW4200 series of cryogenic compres-

sors are 50% smaller than conventional compressors, they can be installed into a standard 19-inch cabinet rack. The compressors are water cooled and operate at low voltages. Each unit can operate one or more refrigerator-cooled cryopumps. For easier installation and operation, the control and electrical elements, helium gas and cooling-water connections, and charcoal adsorber are all located on the same side of the unit. Maintenance consists of replacing the charcoal adsorber after every 18 000 hours of operation. Suggested applications include sputtering and ion-implantation processes, particle accelerator physics, high-temperature superconductor research, infrared and gamma-ray detection, and medical imaging. *Leybold Vacuum Products, 5700 Mellon Road, Export, Pennsylvania 15632*

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Continuous-Flow Cryostats for Spectroscopy

The Supertran ST-100 cryostat from Janis Research can be mounted directly into the sample chamber of most Fourier-transform infrared spectrometers. The cryostat's transfer lines limit liquid helium consumption to less than 1 liter per hour without the need for vapor shielding or vent heaters. The standard system operates from 4 to 325 K and reaches its operating temperature within 30 minutes; versions operating



at higher temperatures can be ordered. For applications not requiring temperatures below 77 K the ST-100 can be operated with liquid nitrogen. The system's sample stage can be rotated with 0.5° resolution and translated with 0.01-millimeter resolution to accommodate multiple samples. With minor modifications the cryostats can be adapted for use in materials characterization, photoluminescence, microscopy and high- T_c superconductivity studies. *Janis Re-*

search, Two Jewel Drive, PO Box 696, Wilmington, Massachusetts 01887-0696

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Stand-Alone Microprocessor-Based Process Controller

The ICS BC 920 controller from Andover Controls has 16 universal inputs for digital, counter, voltage, current or temperature signals and 8 universal outputs for pulse, voltage, current or digital control signals. The eight outputs can also be configured as four tristate outputs for bidirectional control of motors, valves and actuators. The user can write control programs in Andover's Plain English programming language, in which commands resemble English sentences. An input-output expansion port allows the user to add two pneumatic outputs, two analog outputs, two digital outputs or eight digital inputs to the controller, and an optional 2 × 16-character liquid crystal display makes viewing and changing process set points easier. *Andover Controls, 300 Brickstone Square, Andover, Massachusetts 01810*

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Compact Multichannel Analyzer

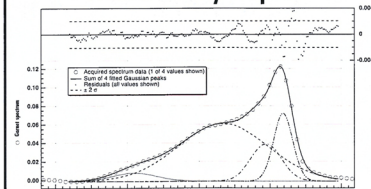
EG&G Ortec's Micronomad multichannel analyzer for NaI-based gamma-ray spectroscopy measures 2.5" × 2.5" × 8", weighs 1.5 pounds and can store up to 63 spectra. These 512-channel spectra can be fed via a parallel port into a computer, and Windows-based software included with the system can then perform a fast peak search and identify the nuclides represented in the spectrum. The analyzer can be controlled by a single switch on its front panel, by a bar-code reader or by programs written in the optional Visual Basic control language.

The Micronomad will run for eight hours on eight AA batteries. Alternatively the analyzer can be powered by an optional 5-volt power supply. The Micronomad is expected to be used in remote applications and in applications where many detectors must cover a large area. *EG&G Ortec, 100 Midland Road, Oak Ridge, Tennessee 37831-0895*

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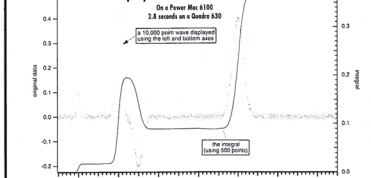
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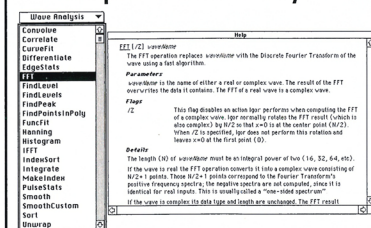


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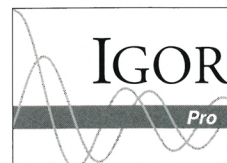
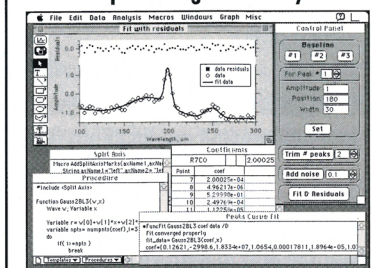
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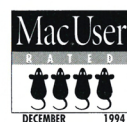


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