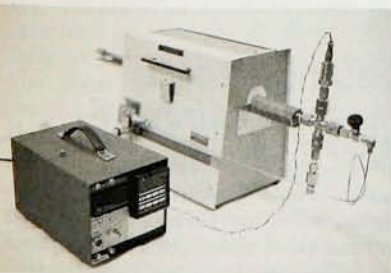


The descriptions of the new products listed in this section are based on information supplied to us by the manufacturers, and in some cases by independent sources. PHYSICS TODAY can assume no responsibility for their accuracy. To facilitate inquiries about a particular product, a Reader Service Card is attached inside the back cover of the magazine.

High-Pressure Oxygen Furnace for High- T_c Superconductors

Morris Research, a new firm started by physicist Donald Morris, offers an innovative furnace system for the synthesis of high-temperature superconductors in high-pressure oxygen. The system can apply pressures up to 300 atm at 930 °C, and up to 200 atm at 980 °C. These conditions allow the synthesis of the new superconductor $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$ (1-2-3), $\text{YBa}_2\text{Cu}_4\text{O}_8$ (1-2-4) in polycrystalline bulk, single crystals and thin films. $\text{YBa}_2\text{Cu}_4\text{O}_8$ may be more useful than the well known $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$ (1-2-3), Morris suggests, because its oxygen content is more stable and orthorhombic distortion is smaller. As a consequence, crystallographic twinning is reduced and mechanical properties are improved. This high-pressure furnace system can also be used to synthesize $\text{Y}_2\text{Ba}_2\text{Cu}_7\text{O}_{15-x}$, which has alternating blocks of the 1-2-4 and 1-2-3 configurations. Another application of the furnace system is to shift the critical temperature of $\text{Bi}_2\text{CaSr}_2\text{Cu}_2\text{O}_{8+x}$ and other superconductors by oxygen doping.

Most important, this furnace system is suitable for the synthesis of new, highly oxidized phases, which, Morris argues, may lead to the discovery of new high-temperature superconductors. (The known high-temperature cuprate superconductors are all very highly oxidized; additional superconductors may be discovered by the use of high-pressure oxygen in the synthesis procedure.)



The Morris Research high-pressure oxygen furnace offers a large sample space (1 cm diameter by 5 cm length), rapid sample change (less than 10 minutes), and rapid heating and cooling. Its minimal oxygen volume reduces safety hazards. It includes an electronic pressure gauge with digital readout and a burst-disc safety relief valve. Oxygen gas is supplied from a standard cylinder. A microprocessor-based temperature controller stores profiles with up to 64 steps. An accessory probe can measure electrical resistivity in situ during high-pressure oxygen treatment. The Morris Research high-pressure oxygen furnace is a compact, integrated, bench-top system that uses 110-120 volt, 50/60 Hz power. *Morris Research, 44 Marguerita Road, Kensington, California 94707.*

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Multichannel High-Speed Data Acquisition

Kinetic Systems is offering a new CAMAC high-speed data acquisition system. Based on the modular CAMAC standard, this new Tachion-I system is designed specifically for large-transient recording applications requiring immediately accessible, high-speed, real-time data. With its parallel-transfer-disk technology and a VAX/VMS host computer, the Tachion-I offers a net throughput to disk of up to five million samples per second.

This system can be used in a variety of data-acquisition applications requiring high throughput, where the data bandwidth either exceeds or would otherwise be limited by the host computer's input-output capacity. Applications range from vibrational analysis to underwater acoustics. A two-crate Tachion-I system with 1.37 gigabytes of disk storage can, for example, acquire vibrational data from 120 accelerometer chan-

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nels, with a sampling rate of 32 kilosamples per second for almost ten minutes. The net throughput in this case is 1.2 megasamples per second.

A complete single-crate Tachion-I system includes a CAMAC front end consisting of a modular list-sequencing crate controller, timer-sequencer, FIFO buffer memory and a parallel bus-crate controller with Q-bus interface. This front end interfaces with a controller for up to four parallel transfer disks and any VAX/VMS computer supporting Q-bus or UNIBUS. The basic system provides 32 analog channels, 689 megabyte disks, FORTRAN, and drivers for CAMAC and the disks. *Kinetic Systems, 11 Maryknoll Drive, Lockport, Illinois 60441.*
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Optical Piezoelectric Micropositioner for Scanning Microscopes

The new optical Piezo-Flex x-y micropositioner from Wye Creek Instruments is a fast, piezoelectrically positioned x-y stage with a range of 200x200 microns. The stage and controller permit accurate, rapid manual or computer positioning with virtually no hysteresis. This compact (6" x 6" x 5/8") stage can be used in ultrahigh vacuum or at atmospheric pressure. The stage has a dynamical range of 2×10^6 , with linear slew rates up to 2000 microns per second.

This new micropositioner can be used with acoustical, optical, electron and scanning tunneling microscopes. It can measure microcircuit linewidths and surface finishes, and it can be used to manipulate biological microstructures and optical fibers. *Wye Creek Instruments, 10809 Gambrill Park Road, Frederick, Maryland 21701.*

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Automated Spectroscopic Ellipsometers

The spectroscopic ellipsometers of the new S2000 series from Rudolph Research are based on the firm's Model 436 and 437 folding optical benches. They cover the wavelength range from 250 nm to 800 nm. Various optical and electronic components are combined with the benches to permit automatic determination of the spectroscopic parameters Δ and Ψ as functions of wavelength from Fourier analysis of the photodetected signal.

A Hewlett-Packard computer controls the ellipsometer and the wavelength-scanning double monochromator. It sets measurement protocols, performs data reduction and presents the results to the operator. The software package contains modeling routines for determining the composition of nonhomogeneous substrates and films, using the Bruggeman and Maxwell-Garnett effective-medium approximations. *Rudolph Research, One Rudolph Road, P.O. Box 1000, Flanders, New Jersey 07836.*
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Shaping and Collimating Diode Laser Beams

Optics for Research has introduced its LDX-3 series of shaper-collimators for diode laser beams. They are designed to reshape the astigmatic outputs of GaAsP (generally 780-850 nm) and InGaAsP (generally 1300-1550 nm) semiconductor diode lasers.



Unlike symmetrizing prisms, the new LDX-3 series does not introduce attenuating polarization effects; nor does it translate the beam laterally, thanks to a new design incorporating micro-cylindrical lenses.

The LDX-3 is capable of continuous "zoom" beam-shaping, from an ellipse ratio of 8:1 to a circle. It is available with optimization and multilayer antireflection coatings in the two laser diode bands. Details are given in a newly published 48-page catalog of precision optical components, available on request. *Optics for Research, P.O. Box 82, Caldwell, New Jersey 07006.*

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Testing Service for Measuring AC Susceptibility

Lake Shore Cryotronics has introduced a testing service for the measurement of ac magnetic susceptibility. The service uses Lake Shore's

Model 7000 ac susceptometer. (See PHYSICS TODAY, July 1988, page 84.) The system can test conventional and high-temperature superconductors (bulk samples, powders, thin films, crystals), paramagnetic and ferromagnetic materials, spin glasses, amorphous alloys and diluted magnetic semiconductors.

The test data can include the temperature dependence of the real and imaginary components of susceptibility, the frequency/ac field effect, the detection of perfect diamagnetism and the determination of magnetic transition temperatures for superconducting, spin-glass and antiferromagnetic transitions.

Lake Shore offers two testing options. One provides precise determination of susceptibility as a function of temperature. The second is a low-cost, rapid screening option, for researchers seeking more general information. Both services provide a data table and plots of volume susceptibility. The testing services are intended for users whose needs do not justify owning a system like Lake Shore's Model 7000 susceptometer. *Lake Shore Cryogenics, 64 East Walnut Street, Westerville, Ohio 43081-2399.* Circle number 145 on Reader Service Card

Secondary Ion Mass Spectrometer

The new 3S static secondary-ion-mass-spectrometer system from Hiden provides rapid surface analysis of materials under static SIMS conditions. This new SIMS system incorporates high-transmission ion optics for expanded dynamic range and a multi-section 12-mm-diameter quadrupole for high sensitivity and resolving power. The system detects both positive and negative ions.

The primary ion source is a low-energy ion gun or a dual combination of ion and atom guns for FAB SIMS. An electron flood gun is used for sample neutralization. The 3S system's automation makes it suitable for running routine samples or developing specific analytical techniques.

The data control system gives storage and recall of all instrument parameters and acquired data. The data are displayed on a high-resolution color monitor. The program permits changes of scales, normalization, comparison, subtraction, smoothing and color plotting. *Hiden Analytical, 231 Europa Boulevard, Gemini Business Park, Warrington, Cheshire WA5 5TN, England.* Circle number 146 on Reader Service Card

Multichannel Analyzer Data Acquisition Interface Board

Nuclear Data's new Accuspec MC is an inexpensive acquisition-interface board that plugs into an IBM PS/2 Model 50, 60, 70 or 80 microchannel system. The Accuspec MC, along with the firm's ASAP supporting software, turns a PS/2 personal computer into a multichannel analyzer. The board contains 16 K data channels of dual-ported spectral memory, loss-free counting support, and both real- and live-time clocks. It can interface with all of the firm's NIM analog-digital converters and acquisition multiplexers, expanding each ADC to receive 32 inputs. As many as seven boards can be installed in one system.



Nuclear Data's display and acquisition software controls the Accuspec MC. The multichannel-analyzer program, which is written in C with assembler optimization of time-critical routines, provides an operator interface and programmability for automated applications. Acquisition, display manipulation and other functions are performed by way of the computer keyboard. The ASAP software can quantify radioisotope concentration for high-resolution germanium spectroscopy. *Nuclear Data, Instrumentation Division, Golf and Meacham Roads, Schaumburg, Virginia 60196.* Circle number 147 on Reader Service Card

New Literature

Photomultiplier shields—Magnetic Shield Corporation offers a new PM-5 catalog of magnetic shields for all presently available photomultiplier tubes. The listing includes their recommended magnetic shield for each tube, the dimensions of the shields and application information. *Magnetic Shield Corp, 740 North Thomas Drive, Bensenville, Illinois 60106.* ■

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