

## Research Resources

A summary of new products and services for materials research...

### MBE for High $T_c$ Superconducting Thin Films:

Several refractory metal molecular beam epitaxy systems have been modified to permit growth of cuprate compounds exhibiting high  $T_c$  superconducting behavior. Values of 90 K  $T_c$  have been reported for  $YBa_2Cu_3O_7$  thin films grown in Riber MBE systems. Issues concerning MBE-grown high  $T_c$  superconducting thin films currently being addressed include oxygen rate control and related pumping issues, rare earth flux control, high pressure  $O_2$  annealing, evaporation source optimization, and chamber design. Instruments SA, Inc., Riber Division, 6 Olsen Avenue, Edison, NJ 08820-2419; (201) 494-8660.

### Ion Beam Etching System:

Versatile, load-lock IBE/RIBE™/CAIBE system permits rapid, sequential, single-wafer processing of 3-inch diameter or smaller substrates, with submicron etch features. Computer-controlled system features fully automated control of vital system parameters. A multichannel mass flow controller enables combinations of process gases and permits inert ion beam etching with aspect ratios of up to 5:1, reactive ion beam etching and chemical-assisted ion beam etching with enhanced etch rates, selectivity, and aspect ratios. Commonwealth Scientific Corporation, 500 Pendleton Street, Alexandria, VA 22314; (703) 548-0800.

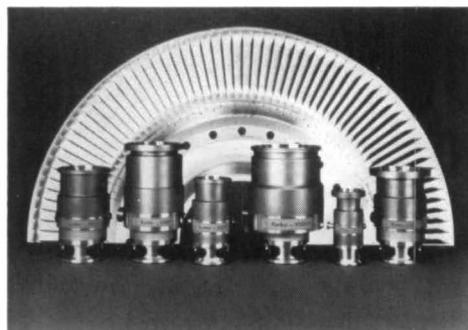
### High Energy Ion Implantation Systems:

Two models cover energy ranges of 100–1,000 keV or 200–2,000 keV using single charged ions. Three types of easily interchangeable ion sources provide a multitude of ion species, making the system suitable for ion beam analysis techniques such as RBS, PIXE, and NRA. A comprehensive range of beamlines and end stations are available to customize systems. High Voltage Engineering Europa B.V., P.O. Box 99, 3800 AB Amersfoort, The Netherlands; 31-33-19741.

**Brookhaven National Laboratory:** Illustrated history of Brookhaven National Laboratory traces research milestones from its founding in 1947 to the present. The 94-page review also enumerates Brookhaven's achievements in basic and applied research in the physical, biomedical, and environmental sciences and in selected energy technologies. Available from National Technical Information Service, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, VA 22161.

**Computers in Physics:** Bimonthly American Institute of Physics publication offers peer-reviewed, archival articles on computer-based research and computer applications in experimental, theoretical, computational and educational frontiers of physics and astronomy. News, tips, computer techniques, and related fields such as geophysics and medical physics are also addressed. American Institute of Physics, 335 East 45th Street, New York, NY 10017; (212) 661-9404.

**Superconductivity:** Weekly research, development, and commercialization newsletter for research scientists, applications engineers, product designers, and corporate planners is designed to "bridge the gap" between laboratory and marketplace by covering developments in basic research and materials engineering, changes in the commercial and political environment, and insights into applications. Business Publishers, 951 Pershing Drive, Silver Spring, MD 20910-4464; (301) 587-6300.



**Turbomolecular Vacuum Pumps:** Turbo-V turbomolecular vacuum pumps with speeds ranging 80–9,000 l/s and clean vacuum to  $10^{-10}$  Torr for semiconductor processing, optics, ultrahigh vacuum research, and nuclear research. The pumps achieve base pressures in the  $10^{-10}$  Torr range, maintain a constant speed below  $10^5$  Torr, and can withstand accidental atmospheric air rush-in. Full pump recovery is possible without regeneration or system cleanup. Accessories include heater bands for bakeout, inlet screens, and vibration isolators. Varian Associates, Vacuum Products Division, 121 Hartwell Avenue, Lexington, MA 02173; (617) 861-7200.

**High-Speed Sputter-Ion Vacuum Pumps:** Three additions to the StarCell VacIon® series deliver pumping speeds of 120, 230,

and 380 l/s for all gases, including hydrogen and argon. The patented elements feature an electrode structure with two radially symmetrical, finned cathode areas concentric with the anode cells to boost pumping efficiency and stability ratings for noble gases, minimize distortion of the cathode plates due to hydrogen by confining wear to individual fins of the star-shaped cathode cells, and optimize the amount of available titanium to increase pumping speed for getterable gases such as oxygen and nitrogen. An optional control unit enables operators to control pumping processes automatically and provides remote signals for computer interface. The control unit displays include an indication of pump status. Varian Associates, Vacuum Products Division, 121 Hartwell Avenue, Lexington, MA; (617) 861-7200.

### Diode Array Detector for Liquid Chromatography:

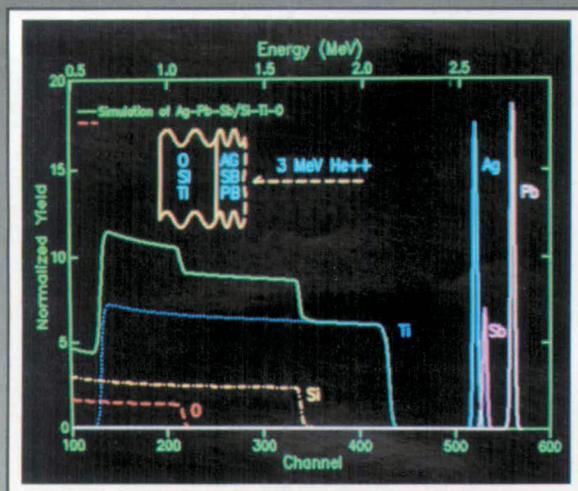
Programmable diode array detector can significantly extend the capabilities of any liquid chromatograph. Featuring modular electronics and self-diagnostics, the LC/9570 is capable of single- or dual-wavelength monitoring, time programmable wavelengths, and absorbance ratioing. The detector accommodates manual or automatic collection of up to nine spectra per run. Its auto-store function stores the spectrum when the peak maximum occurs; stored spectra can be transferred to recorders, integrators, or systems that handle analog data. IBM Instruments, Orchard Park, P.O. Box 3332, Danbury, CT 06813; (800) 243-7054.

### Materials Journal Translated into Japanese:

The *Journal of Materials Education*, published bimonthly by the Materials Education Council of Pennsylvania State University's Materials Research Laboratory, is now being translated and published in Japanese. A journal-textbook of instructional modules, the publication is intended primarily for graduate and continuing professional education in materials science and engineering. Institutional subscription confers unlimited copying rights. *Journal of Materials Education*, 110 Materials Research Laboratory, University Park, PA 16802; (814) 865-1174.

**Microbalances:** Brochure provides specifications on the C-30, C-31 and C-32 microbalances with taut-band suspension, 3.5 gram capacity, and a two-pan design that eliminates problems caused by varying laboratory temperatures. The C-32 and

# RBS Surface Analysis System



- Beam energy variability to 3 MeV.
- Helium and proton beams in one system.
- Low divergence beam for full channeling capability.
- Complete RBS software.

The National Electrostatics Corporation manufactures complete, versatile Rutherford Backscattering Analysis Systems. These RBS systems are highly versatile with ion beam energy variability which allows greater control over the depth resolution of elements detected.

The heart of this system is the NEC Pelletron Accelerator which is well known for reliability, low maintenance and exceptional terminal voltage stability.

The ion beam from the Pelletron Accelerator interacts with the target in a 17" diameter scattering chamber complete with detection system and 5 axis target manipulator.

For further information contact:



**National Electrostatics Corp.**

Graber Road, Box 310  
Middleton, Wisconsin 53562

Tel: 608/831-7600  
Tx: 26-5430 Fax: 608/256-4103

Please visit Booth No. 702 at the MRS Show.

C-31 are sensitive to 0.1  $\mu\text{g}$ , the C-30 to 1  $\mu\text{g}$ . The C-32 remote microbalance is designed for researchers working with glove boxes, environmental chambers, and radio-isotope hotboxes. An exclusive standard feature provides in-house calibration for all Series 30 balances. Cahn Instruments, 16207 South Carmenita Road, Cerritos, CA 90701; (800) 423-6641.

**Thermocouple Gauge Controller:** Temperature compensated for operation from 0 to 50°C and bakeable to 100°C, the GTC 380 measures vacuum pressure in a noncorrosive environment from 2 to 10<sup>-2</sup> Torr. The controller has two channels with dual, fully adjustable setpoints featuring LEDs to indicate trip-point status. A highly visible bar graph indicates vacuum pressure. CVC Products, 525 Lee Road, P.O. Box 1886, Rochester, NY; (716) 458-2550.



**Electronic Moisture Balance:** Electronic top loading balance with heater unit uses the dry-and-weigh method for rapid measurement of water content. The device features highly accurate weighing (measuring conditions can be adjusted within a wide range), uniform heating (plate-type ceramic heaters emit infrared rays from the entire surface), durable ceramic heaters, and automatic shutdown and water content display. Optional accessories include an EP 40-20 printer and an RS232 serial output buffer. PTX-Pentronix, 1737 Cicotte, Lincoln Park, MI; (313) 388-3100.

**Compact Sputter Coater:** The SCD 040 features an 8-in. chamber and a motor-driven specimen table that can be adjusted from outside the vacuum. Users can rotate a 6-in. wafer under the 2-in. sputtering target and select sputtering, etching, or carbon thread coating at the front control panel, which also displays sputtering voltage, operating temperature, and current. An interface is provided for quartz crystal monitoring. Balzers, 8 Sagamore Park Road, Hudson, NH 03051; (603) 889-6888.

**Programmable Indexer/Driver:** Model 86MM single-enclosure package (indexer, motor drives, and power supplies) for controlling one or two motors singly drives an X-Y positioning table to perform a repetitive grid matrix pattern for testing, assembly, or packaging. A microcomputer stores a user-entered program and motion parameters. Commands and data can be entered via the front panel keypad or an RS232C interface from any host computer, terminal, or programmable controller. Velmex, P.O. Box 38, East Bloomfield, NY 14443; (716) 657-6151.

**1987 MRS Fall Meeting  
Equipment Exhibit**

See p. 90 in this issue.