

NEW PRODUCTS

The descriptions of the new products listed in this section are based on information supplied to us by the manufacturers. 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.

FOCUS ON SEMICONDUCTOR TECHNOLOGY

Gas Purifiers for Semiconductor Manufacturing Equipment

Aeronex, a manufacturer of high-purity gas and liquid delivery systems, has introduced its new M-series Gatekeeper inert-gas purifiers, designed to accommodate high volumes and fast flow rates. The M-series units are claimed to have "the lowest cost and smallest footprint of any high-flow-rate purifiers currently on the market." They are also portable and unheated, for use in locations where heat is undesirable or power is inaccessible.

The M-series devices can be factory regenerated at about one-fourth the cost of a new purifier. The Gatekeeper purifiers are suitable for area gas purification of semiconductor manufacturing equipment such as furnaces and tools for deposition and sputtering, argon weld gas purification for welding and drying down piping for high-purity processes, purification of gases in industrial hard-coating processes, and other factory feeds for high-purity systems.

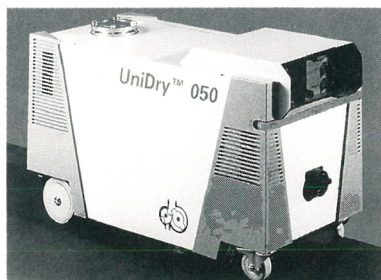
The purifiers have modular construction. The basic unit—the 10M—can purify 10 million liters of 99.999% pure gas or 100 million liters of 99.9999% pure gas (a typical plant feed from a liquid source) at flow rates up to 500 liters per minute. The 10M is mainfolded together other 10M purifiers to form standard configurations of the 20M and 40M, to provide higher flow rates and longer life. The purifiers remove such contaminants as water, oxygen, CO₂ and CO from inert gases or hydrogen. The proprietary metallic purifying medium contains no

organics that might outgas. *Aeronex, 6975 Flanders Drive, San Diego, California 92121*

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Four-Stage Pump for Semiconductor Processing

Pfeiffer Vacuum Technology has introduced its new four-stage UniDry vacuum pump for semiconductor process-



ing. It utilizes an innovative compressing principle, we are told, to achieve good reliability and uptime. Its volume flow rate goes up to 34 ft³/min, and it can produce a vacuum down to 0.03 torr. The pump can operate down to 75 torr with only air cooling. The instrument's temperature management system keeps the temperature constant throughout the pump, thus reducing condensation. An optical microprocessor permits local or remote control of process parameters.

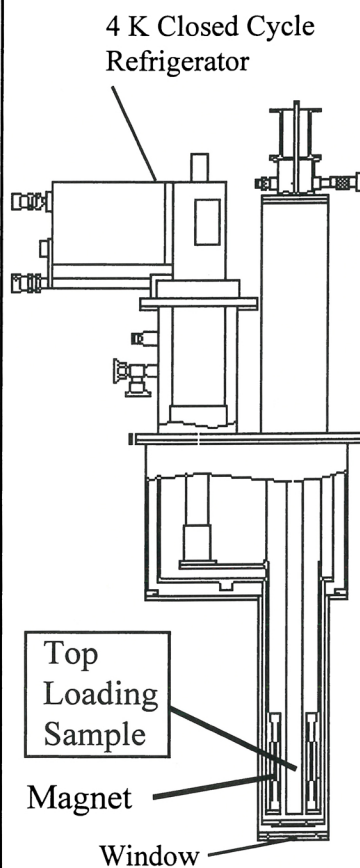
When combined with a Pfeiffer standard or corrosive turbodrag pump, the UniDry becomes a complete pumping system. It provides hydrocarbon-

CRYO

What's New?

Cryogen-Free Superconducting Magnet Systems to 14 Tesla!!

- Sample Variable Temperature < 4.2 to 300K!



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OPTICAL RAY TRACERS

Now: FOUR platforms!

Windows
PC-DOS
Macintosh
PowerMac

BEAM TWO \$89

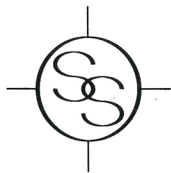
- + for students & educators
- + traces coaxial system
- + lenses, mirrors, irises
- + exact 3-D monochromatic trace
- + 2-D on-screen layouts
- + diagnostic ray plots
- + least squares optimizer
- + Monte Carlo ray generator

BEAM THREE \$289

- + for engineering applications
- + all BEAM TWO functions, plus:
- + 3-D optics placement
- + tilts and decenters
- + cylinders and torics
- + polynomial surfaces
- + 3-D layout views
- + glass tables

BEAM FOUR \$889

- + for advanced professional work
- + all BEAM THREE functions, plus:
- + big tables: 99 surfaces
- + full CAD support: output to DXF, plotter, PostScript
- + point spread function
- + modulation transfer function
- + wavefront display too



STELLAR SOFTWARE

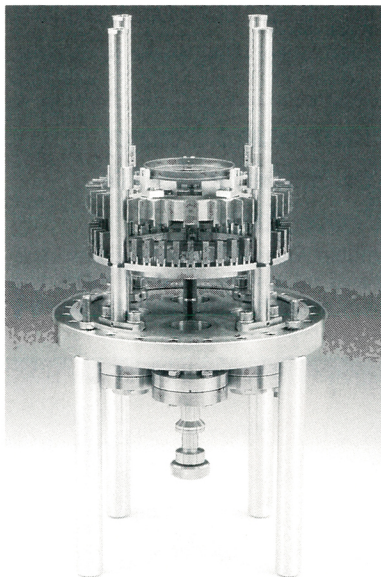
P.O. BOX 10183
BERKELEY, CA 94709 USA
PHONE (510) 845-8405
FAX (510) 845-2139
WWW.STELLARSOFTWARE.COM

free high vacuum with gas flows up to 1500 liters per second. In combination with a Pfeiffer Roots pump, the UniDry reaches pumping speeds of 650 ft³/min. Pfeiffer Vacuum Technology, 24 Trafalgar Square, Nashua, New Hampshire 03063-1988

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Scanning-Tunneling and Atomic-Force Microscope for Large Wafers

Omicron Associates is offering a new large-sample ultrahigh-vacuum scanning probe microscope that permits the characterization, with atomic resolution, of semiconductor wafer samples up to 4 inches in diameter. The mi-



croscope is intended for integration into systems doing things like molecular-beam epitaxy or metal-organic chemical vapor deposition. It is available in both atomic-force and scanning-tunneling modes.

The recent addition of the atomic-force microscopy mode allows the observation of electrically insulating surfaces and layers on processed wafers. The AFM detection is based on Omicron's proprietary needle-sensor technology. This needle sensor is purely electrical, obviating any additional adjustments and permitting convenient switching, back and forth, to the scanning-tunneling mode. The instrument incorporates the firm's integral vibration-isolation design, and it is operated

by the SCALA control system, with standard topographic, spectroscopic and tip-induced nanostructuring software. Omicron Associates, 1226 Stoltz Road, Bethel Park, Pennsylvania 15102

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Point-of-Use Scrubbing Systems for Semiconductor Processing

Misonix has introduced its new Mystaire POU line of point-of-use scrubbing systems for various semiconductor etch and deposition processes—in particular, WF6 and BC13 applications. These scrubbers combine several scrubbing techniques in series for combined control of particulates (such as SiO₂ and WO₃) and gases, which are typically both present in tool exhaust streams. Very long residence times yield extremely high removal efficiencies, we are told, even on the more difficult process gases. A novel nitrogen inlet prevents humidity from backstreaming to vacuum pumps and process chambers, thus eliminating plugging and other such problems that are common on wet scrubbers.

Integral sump and mist eliminators are provided with each system. Available options include complete instrumentation packages with PCL controllers, automatic pH adjustment, liquid filtration, solenoid valve, flow sensors, pressure measurement and outlet emissions monitors. Misonix, 1938 New Highway, Farmingdale, New York 11735

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Dry Pump for Etch and CVD in Semiconductor Manufacturing

Edwards High Vacuum International is offering its new iH series drypumps, intended for semiconductor manufacturing applications. They will be available at the end of the year. The design goal, we are told, was "to provide high reliability, long time between failures and low cost in harsh processes." The new iH pumps are intended for etching, chemical vapor deposition (CVD) and other processes in the manufacture of silicon wafers and flat-panel displays. Pumping speed has increased to address the 300 mm requirement, but

the system footprint has in fact been shrunk.

The iH dry pumps are well suited to handling particulates. But they can equally well handle compensatable etch and CVD byproducts, we are told, at "surprisingly low cost." *Edwards High Vacuum, One Edwards Park, 301 Ballardvale Street, Wilmington, Massachusetts 01887*

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Cluster Tool Platform for Semiconductor Metallization

CVC, a supplier of thin-film process equipment for the manufacture of semiconductor integrated circuits and magnetic recording heads, has introduced the Connexion 800, a new interconnect cluster-tool platform. The instrument is designed for the advanced metalization market. When the Connexion 800 is combined with other CVC process technology, we are told, its modular design will enhance productivity, making it "the workhorse of the industry."

Microprocessors now running at 500 MHz will soon be running at a gigahertz. Therefore, more advanced devices will be required for ultrahigh-speed data and signal processing. Future devices employing 0.18–0.13 micron geometries will require new, more advanced metallization processes. CVC claims that the Connexion 800 cluster tool provides the industry with just such an advanced copper-metallization solution for the production requirements of the next generation.

The Connexion 800 can support six SMIF- and AGV-compatible process modules and dual load locks. It is suitable for barrier/liner and copper interconnect applications. In addition to integration with the firm's PVD, CVD and RTCVD modules, the Connexion 800 can also be integrated with MESC-compatible modules from other manufacturers. *CVC, 525 Lee Road, Rochester, New York 14606*

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High-Current Solid-State Laser Diode Driver with Fast Rise

Energy Compression Research, a San Diego firm, is offering its new model LDS-50, a solid-state, high-current

pulse generator designed for driving laser diodes and other low-impedance loads. The instrument is claimed to provide the fastest rise time and highest peak time currently available on the market. It is suitable for biomedical sensors, fiber-optic system development and testing, LIDAR and other research applications requiring the driving of low-impedance loads.

The LDS-50 has a peak current of 120 A, with a rise time of less than 2 ns and a pulse width of 50 ns. Delay through the unit is 50 ns, with a jitter of less than 200 ps. The pulse width is fixed, and the peak current can be controlled by a one-turn pot. The device is externally triggered by a TTL signal supplied by the user. Pulse repetition frequency can be varied from single shot up to 5 kHz.

The unit includes an EG&G PG4U4S12 laser diode, which delivers a peak optical energy of 2 microjoules at a wavelength of 905 nm. Fiber coupling at 60% efficiency can be achieved. A current monitor and power supplies running off 120 VAC are included. *Energy Compression Research Corp, 6355 Nancy Ridge Drive, San Diego, California*

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Updated Version of the Mathematica Software System

Wolfram Research has released version 3.0.1 of its widely used Mathematica system. New optimizations in the version have led to significant speed increases, we are told, in all kernel operations, under both Windows 95 and Windows NT. In particular, performance on Pentium-class processors has been greatly enhanced. Typical calculation-intensive operations are now at least 50% faster.

The new version can perform more algebraic transformations, sums, simplifications and symbolic integrations than its predecessors. Japanese language compatibility has been added on the Windows and Mac OS platforms. Printing under Windows has also been improved: Printing on HP-PCL printers, for example, now requires significantly less memory. For some graphics, memory usage has been reduced by as much as 90%. Color gradations are now fully supported, and PostScript font handling has been improved. *Wolfram Research, 100 Trade Center Drive, Champaign, Illinois 61820-723792121*

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World's Smallest MCA



Size: 6.5" x 2.8" x 0.8"

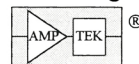
(165mm x 71mm x 20mm)

Weight: <300 grams (including batteries)

The **MCA8000** is a full featured, low power **Multichannel Analyzer** intended to be used with a wide variety of detector systems.

FEATURES

- ⊙ Up to 8k data channels
- ⊙ 24 hours of continuous data acquisition from two 1.5V AA batteries
- ⊙ Differential nonlinearity $\leq \pm 0.6\%$
- ⊙ Integral nonlinearity $\leq \pm 0.02\%$
- ⊙ Input accepts fast pulses - as short as 100 ns shaping time constants
- ⊙ Two TTL compatible gates
- ⊙ Stand-alone data acquisition
- ⊙ Successive-approximation ADC with two stage input analog pipeline and sliding-scale linearization
- ⊙ 115.2 kbps interface
- ⊙ PMCA Software Included
Windows and DOS software supports ROI, energy calibration, peak information, MCA configuration, and file management.



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