# 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.

## B–H meter for magnetic thin film samples

The LDJ model 15000 is a microprocessor-controlled **B–H** meter intended for testing magnetic thin-film samples. A Helmholtz coil set applies a homogeneous drive field across a standard 3-inch sample substrate. Curves of **B** vs **H** and data are displayed on the instrument's CRT. They can be stored on floppy disks for later retrieval or printed on an optional printer/plotter.

The sample under test is automatically rotated to the desired angular position for measurement and display of the easy-axis or hard-axis loops. Other measured parameters include field intensity, angular position, Kobolev and other coercive forces, saturation induction and magnetostriction. Additional software requirements can be programmed by the user; LDJ also provides customized programming. *LDJ, PO Box 219, Troy, Michigan 48099*

**Circle number 140 on Reader Service Card**

## Microminiature refrigerator for optical transmission

MMR Technologies has added to its line of Joule–Thomson gas-expansion temperature-characterization systems a microminiature refrigerator kit designed for optical transmission experiments. This system, we are told, will be of interest to the spectroscopist or microscopist needing to study a variety of samples in the temperature range from +100 °C to −196 °C (77 K).

The system is available in a number of configurations. An optical transmission clip-on pad permits beam transmission through the sample, and a plain clip-on pad permits reflectance studies. Both types are included in the kit. Right-angle reflectance measurements are also possible with a modified vacuum jacket containing a side window. Sapphire windows are standard, but the vacuum jacket can be supplied with unmounted windows or special windows of BeO, quartz or other materials. Twelve nonmagnetic feedthrough pins are provided for electrical connections to the sample. The system is available with or without a temperature indicator/controller. *NMR Technologies, 1400 Stierlin Road, Suite A-5, Mountain View, California 94043*

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## Lock-in amplifiers and boxcar integrator

Moxon Electronics, US distributor for the Japanese firm N–F, has introduced N–F lock-in amplifiers to the American market. The N–F LI574 and 575 lock-in amplifiers are claimed to be the industry standard in Japan. These lock-in amplifiers offer 10-nanovolt sensitivity and a 100-dB range. Their primary application is measuring very-low-level signals in the presence of large common-mode noise levels such as one encounters in nuclear magnetic research, cryogenic resistance measurement and laser-optical fluorescence experiments.

The N–F instruments are claimed to offer lower intrinsic input noise levels, higher dynamic reserve and wider frequency tracking than the conventional lock-in amplifiers, with built-in phase and vector outputs and calibrated device-noise measurement capability. The LI574 costs $2900. The 575 is a heterodyne-type design with phase and amplitude metering, and autotracking ability, which eliminates the requirement for a reference signal. The 575 is priced at $7600.

Moxon has also introduced the N–F digital boxcar integrator, model

# new products

BX531. This is a microprocessor-controlled instrument that recovers low-level signals buried in high common-mode noise. The BX531 features fast a–d converters and memory that provides infinite data-holding time and GPIB capability for direct computer processing of recovered signal waveforms. The unit also can perform digital signal averaging. The BX531 is priced at $6850. *Moxon Electronics, 1970 South Santa Cruz Street, Anaheim, California 92805*

**Circle number 142 on Reader Service Card**

## Mode-locked, 30-picosecond neodymium YAG laser

The Lasermetrics Convertible YAG Laser is claimed to be the most versatile Nd:YAG mode-locked laser on the market today. The Convertible YAG system can be configured to cover the pulse-duration range from 30 picoseconds to 250 microseconds. Mode-locking, Q-switching and conventional-mode operation are accomplished conveniently through the appropriate combination of the components included in this modular system.

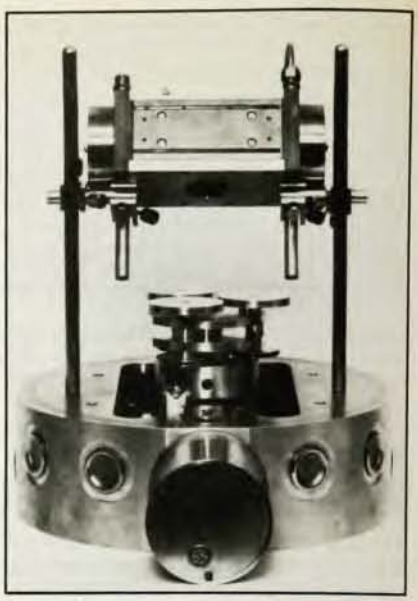
The system is provided on a honeycomb optical bench for rigidity, stability and vibration isolation. Optical components are Invar-mounted in high-stability three-point-suspension gimbal mounts to insure accurate and repeatable alignment. The laser head utilizes a linear flash lamp and a single-ellipse, gold-plated, close-coupled reflector to achieve a good spatial mode. The flowing dye cell provides a laminar flow with continuously variable light path through the fluid for optimization of the mode-locked laser pulses. Temperature of the flowing dye and the laser head are accurately controlled to within $\pm 0.1$ °C by a closed-cycle refrigeration system providing a highly stable output.

Amplifiers are available for higher outputs in all three configurations. Optional second, third and fourth harmonic generators are available for generating into the green and ultra-violet. *Lasermetrics, 196 Coolidge Avenue, Englewood, New Jersey 07631*

**Circle number 143 on Reader Service Card**

## Workstation for atomic-beam substrate cleaning and milling

Model FAB366 from Microscience is a collar-mounted work station for atomic-beam substrate cleaning, milling and sputter deposition. It is suitable for wafers up to 5″ in diameter. The module consists of a 10-mA saddle-field



neutral source mounted over a planetary substrate holder. The source provides an output of energetic atoms in the range 1 Kev to 4.5 Kev. The output consists of neutralized ions of the input gas. The charge-free character of the atomic beam lends itself to work with charge-sensitive materials. The source contains no filament; it may be used for reactive-ion beam milling with gases such as $O_2$, $CF_4$, $CCl_4$ and $SF_6$. *Microscience, PO Box 443, Weston Massachusetts 02193*

**Circle number 144 on Reader Service Card**

## Eight-channel programmable instrumentation amplifier

The Transiac model 1008 is an eight-channel programmable instrumentation amplifier in a 1-cm wide CAMAC modular package (IEEE standard 583). This compact packaging contains eight programmable amplifiers with a common-mode rejection ratio of 108 dB. The bandwidth is 100 kHz for a gain of 1 and 10 kHz for a gain of 1024. There are eleven gain settings; they can be programmed by computer or read and set from the front panel. The amplifier is well suited, we are told, for signal conditioning with fast data loggers such as the Transiac Traq 1 system or for other CAMAC digitizers with sampling speeds up to 100 kHz. A single CAMAC crate is claimed to have the capacity of 184 amplifiers interfaced to Apple or DEC computers. The price is $1600. *Transiac 2375 Garcia Ave., Mountain View, California 94043*

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## Thermoelectric baffle for high-vacuum systems

The BCT thermoelectric baffle introduced by CVC is intended for use on

diffusion-pumped high-vacuum systems. The baffle utilizes thermoelectric cooling, creating a temperature drop by means of current flow through two dissimilar semiconductors. This new device achieves temperature as low as $-35$ °C. It is particularly suited, we are told, to applications requiring a compact, lightweight, low-power-consumption cooling package of low cost and high efficiency. The BCT baffle eliminates the need for the compressors and cooling costs required by other baffle techniques. It runs off a conventional 115 V ac wall socket. The system has no moving parts, and it consumes 35% less power than an ordinary freon-compressor baffle system. CVC models BCT-21 and BCT-31 are specifically designed for use with the 2-inch and 3-inch diffusion pump systems. *CVC Products, 525 Lee Road, PO Box 1866, Rochester, New York 14603*

**Circle number 146 on Reader Service Card**

## High-speed, low threshold semiconductor laser

Ortel has introduced two new GaAlAs semiconductor laser diodes: models LDM3-H and LDS3-H. Both units are highly efficient single-spatial-mode diode lasers with very low threshold, emitting up to 3 mW of optical power. Light–current characteristics are highly linear and kink-free. Model LDM3-H features multi-longitudinal-mode operation, while model LDS3-H provides single-longitudinal-mode operation.

The high-speed performance of these models allows modulation of the lasers to 3 GHz, with typical rise and fall times of 150 ps. Threshold current is only 15 mA. The 840-nm output wavelength is well matched to most optical fibers and to both GaAs and Si photodiodes. The absence of astigmatism and the nearly circular far-field pattern allow the output beam to be easily collimated or focused to a diffraction-limited spot.

The laser structures consist of an embedded double heterostructure grown on a semi-insulating GaAs substrate. The output facets are passivated to assure long operating lifetime. The laser chip is mounted junction side up on the heat sink, and the mount allows complete access to the front facet of the laser. Light from the rear facet can be used to monitor the laser output power. Prices are around $500. *Ortel Corporation, 2015 W. Chestnut Street, Alhambra, California 91803*

**Circle number 147 on Reader Service Card**

## High-vacuum cryogenic pumping system

The Temescal Division of Airco has introduced a new line of high-vacuum cryogenic pumping systems. The line includes three Cryomax closed-circuit, two-stage cryogenic pumps—the Cryomax 200 pump (7.7″ inner diameter), the Cryomax 300 (12″), and the Cryomax 550 (22.5″)—each accompanied by a helium compressor. Available options include an electronic cryopump temperature monitor, electronic cryopump/regeneration control, and an integral variable throttle valve for sputtering applications.

Cryogenic pumps, we are told, have three main advantages over other high-vacuum pumps: they have greater pumping speed for water vapor, eliminating the need for liquid nitrogen in most applications; they are cleaner, emitting no contaminating fluids, even in the event of power failure or malfunction; they can be mounted in any orientation, allowing great freedom of integration in system design.

The Cryomax pumps represent the second generation and the newest application of the Gifford–McMahon closed-cycle cryorefrigeration system. The Cryomax pumps have two refrigeration stages: the first stage condenses water vapor and carbon dioxide; the second stage, with its activated charcoal, pumps all other gases by cryocondensation and cryosorption. *Airco Temescal, 2850 Seventh Street, Berkeley, California 94710*

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## New literature

**Vacuum pumps**—A new 34-page catalog is being offered by Balzers. It details their line of roots vacuum pumps and pumping systems for applications requiring vacuums ranging from atmospheric pressure to $5\times10^{-5}$ mbar. The *Roots Pump Catalog* provides pertinent specifications on volume flow rates, noise levels, operating speeds, leak rates, motor ratings, product dimensions and a description of pump models. *Balzers, 8 Sagamore Road, Hudson, New Hampshire 03051* □