

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.

Calculating Optical Parameters of Materials

ARSoftware is introducing a program for computing the optical properties of a variety of materials that runs on any IBM-compatible PC with DOS 3.2+. OPTIMATR was developed in collaboration with the electro-optical systems group at the Johns Hopkins Applied Physics Laboratory.

OPTIMATR computes index of refraction, absorption coefficient and scattering coefficient for each material as a function of temperature and wave-number or wavelength. OPTIMATR is an interactive program that provides an on-line means of determining these optical properties and displaying them in graphic and tabular form. One can save results and use them as input in a variety of programs for further calculations or plotting.

OPTIMATR provides the on-line equivalent of a large number of separate references for ascertaining the specified optical properties. The reference and bibliographic sections of the documentation provide information on the computational models used. Each material entry is keyed to a source reference in the bibliography section of the user's manual. Currently there are 86 materials in OPTIMATR's database. OPTIMATR is being offered by way of introduction at \$495 until the end of July. ARSoftware, 8201 Corporate Drive, Suite 1110, Landover, Maryland 20785
Circle number 200 on Reader Service Card

Graphical Interface for Particle Accelerator Simulation

MacTrace from Gillespie Associates is a sophisticated graphical user interface for use with TRACE 3-D, the Los Alamos particle beam optics program. The interface is based on SPARC parti-

cle accelerator software technology.

Problem setup and definition are accomplished graphically. All of the 16 types of transport elements available in TRACE 3-D, as well as the initial and final beam-emittance (Twiss) parameters, are represented by icons on a scrollable palette. The configuration of a beam line is set up visually by selecting and dragging the desired piece icons to a model window. Parameter values are entered into data windows for each element in the beam line.

MacTrace takes care of setting up arrays and similar bookkeeping. A minimal amount of alphanumeric input is needed for setting parameters, and no text or command-line input is required. Expert system rules are built into the data input windows to assist users in assigning parameters. These include options for parameter units, both fixed and scaled smart units, and limit guidelines for each parameter. The limits incorporate constraints imposed by TRACE 3-D and practical constraints derived from hardware experience.

MacTrace is fully integrated with TRACE 3-D, and it runs in stand-alone mode on Apple Macintosh computers. G. H. Gillespie Associates, PO Box 2961, Del Mar, California 92014
Circle number 201 on Reader Service Card

Small Cryogenic Pressure Sensors

Keller-PSI has introduced its new Series 400 line of pressure sensors for measuring gas and liquid pressures at cryogenic temperatures down to 1.5 Kelvin. Using a silicon piezoresistive element housed in a TIG-welded stainless steel package, the Series 400 can be installed and submerged within cryogenic systems. These small units, we are told, offer low hysteresis, low nonlinearity, low nonrepeatability and power dissipation of less than 6 milliwatts.

The compact Series 400 pressure

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- diagnostic ray plots
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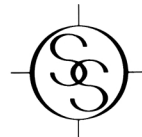
- for advanced applications
- BEAM TWO functions, plus:
- 3-D optics placement
- tilts and decenters
- cylinders and torics
- polynomial surfaces
- 3-D layout views
- glass tables

BEAM FOUR \$889

- for professional applications
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High-Voltage Equipment

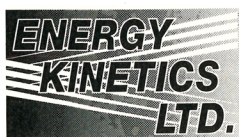
■ Trigger Generators for Thyratrons and Spark Gaps.

■ Impulse Generators to 100kV.

■ High Voltage Pulsers.

■ Crowbar Systems.

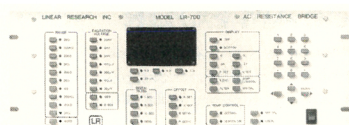
■ Optically Isolated Control Systems and Bus Interface Modules.



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NEW FOR 1993 LR-700



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- Mutual inductance (X) option available
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- Drives our LR-130 Temperature Controller
- Multiplex units available 8 or 16 sensors

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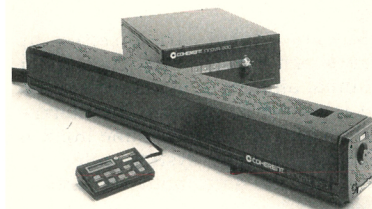
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sensors are available as absolute or differential devices in various pressure ranges from 0-1 through 0-5000 psi. Electrical connections are hermetically sealed against hostile environments. All units are factory calibrated and are shipped with a complete calibration report. *Keller PSI, 503 Vista Bella, Suite 11, Oceanside, California 92057*

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Small-Frame Krypton Ion Laser

Coherent has introduced a new ion laser system—the Innova 302. It is the newest member of the Innova 300 family of ion laser systems. The Innova 302 is a small-frame krypton ion laser capable of providing violet and ultraviolet performance up to 300% higher than previously available, we are told. This laser system is



useful for applications such as optical-disk mastering. Higher powers at short wavelengths allow more information to be stored on a single disk.

The design goal of the Innova 302 was to provide a level of violet and ultraviolet performance that would allow the development of new applications. The Innova 302 incorporates all of the principal 300 Series features such as Coherent's actively stabilized optical cavity, active etalon stabilization that eliminates mode-hops in single-frequency operation, and complete on-board system diagnostics. These features are intended to provide hours of unattended operation. *Coherent, 5100 Patrick Henry Drive, PO Box 54980, Santa Clara, California 95056-0980*

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Calibrators for Vacuum Systems

The NGS Division of MKS Instruments is offering a new family of vacuum calibration systems intended to help users of vacuum instrumentation satisfy ISO 9000 requirements.

All of these systems use Baratron transfer standards with NIST-traceable calibration certification and a high-level analog or digital output signal.

Available systems in this new line include a portable carrying-case system (PTS-2), a fully integrated cart-mounted system (PVS-6) and a laboratory-based system (VGCS-300). System accuracy, we are told, is 0.05% of reading. Operational range is from 10^{-4} mm (Hg) to atmosphere. The laboratory-based system provides an accuracy of approximately 1% of reading, $\pm 3 \times 10^{-8}$ mm (Hg) in the range from 10^{-7} to 10^{-3} mm (Hg) with the MKS spinning-rotor gauge. *MKS Instruments, 6 Shattuck Road, Andover, Massachusetts 01810*

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Well-Focused Ion Beam Source

Atomika has introduced a new micro-focus ion source, which they call the Model SG 440 fine-beam ion source. This source is designed to deliver well-focused ion beams with improved current density at lower ion energies, thus allowing faster depth-profile measurement with better depth resolution.

With a beam diameter of approximately 100 μ m, the ion current reaches 0.3 microamps at 1 keV ion energy, 1 μ A at 2 keV and 3 μ A at 5 keV. The minimum beam diameter at 5 keV is below 30 μ m. The cold-cathode ion source delivers not only Ar, Ne and He ions but also a very stable O_2 ion beam while maintaining long cathode life.

The fine-beam source is also available with a mass-analyzed ion beam under the model number SG 441. These fine-beam sources provide ion guns for applications such as AES, ESCA/XPS, static SIMS and sputter cleaning. *Atomika, Bruckmannring 5, W-8042 Oberschleissheim, Germany*

Circle number 205 on Reader Service Card

Multifunction Dual-Phase Lock-In Amplifier

EG&G Princeton Applied Research has introduced a new multifunction lock-in amplifier, the Model 5110. The new amplifier is a dual-phase unit with switch-selectable inputs for either voltage or current. Low-level signal measurement is enhanced by the use of low-noise circuitry in a unit that offers the choice of fundamental or square-wave response. The refer-

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ence channel will accept virtually any periodic waveform at its analog input if the internal oscillator is not used. A TTL reference input is also provided.

The Model 5110 can be fully controlled through its front panel or from a host computer. Both RS232 and IEEE-488 interfaces are provided. The Model 5110 incorporates many automatic features, including setting of the required sensitivity, filter frequency and phase correction. Four spare analog-to-digital inputs are provided on the rear panel as a means of digitizing information from other sources and presenting the digitized data to the host computer. Two digital-to-analog outputs allow the generation of analog voltages from the computer for controlling peripheral equipment to perform such tasks as adjusting lamp intensities and magnetic field or varying the speed of a motor. The Model 56110 also provides eight logic level outputs that can be set true or false either from the computer or manually to allow control of equipment such as incrementing monochromators, order sorting filters or sample changers. *EG&G Princeton Applied Research, PO Box 2565, Princeton, New Jersey 08543*
Circle number 206 on Reader Service Card

Attachments for Electron Beam Lithography

The German firm Raith has introduced a new low-cost electron beam lithography attachment, which it calls the Proxy Writer. This instrument is intended primarily for device researchers interested in nanolithographic quantum devices, mesoscopic structures, x-ray lenses and the like. It performs standard CAD-capability pattern-design multilevel lithography. The Proxy Writer also has proprietary built-in proximity-correction software for simulation and correction of designed patterns.

For more advanced applications Raith offers the new Elphy Plus system, which has all the standard features of Proxy Writer and more. In particular, it operates under a Windows environment for interfacing with microscopes, and it has flexible pattern import/export (for example, GDSII, ICED and CAD) and postprocessing facilities in both flat and hierarchical formats.

Elphy Plus also contains fast opto-isolated, thermally controlled electronics with a second microprocessor that allows writing speeds of up to 2

MHz, automatic mark alignment and access to Raith's proprietary laser interferometer stage. This stage provides field stitching capability below 50 nanometers. Both the Proxy Writer and Elphy Plus systems can interface with almost all SEMs and stages. *Raith GmbH, Hauert 18, Technologiepark, D-4600 Dortmund 50, Germany*
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Dual-Phase Lock-In Amplifier

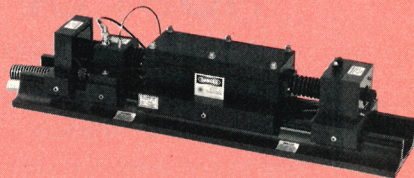
The new Model 200 dual-phase lock-in amplifier from Palo Alto Research operates over a frequency range from 0.5 Hz to 100 kHz. The input stage has a range from 100 nV to 1 V full scale, with a noise level of 6 nV/ $\sqrt{\text{Hz}}$. The amplifier includes a current input with adjustable bias and a gain of 10^6 to 10^8 . Independent high-pass, low-pass, band-pass and notch filter sections provide 100 dB dynamic reserve and better than 70 dB harmonic rejection. The output stage has a stability of 5 ppm/ $^{\circ}\text{C}$ and time constants ranging from 30 μs to 100 s.

Synchronous triggering of the internal 16-bit analog-to-digital converter reduces output jitter, we are told. An internal oscillator with 0.2% distortion and output amplitude from 0.05 V to 5 V is included. The parameters x , y , r , θ , noise and ratio are shown on the large backlit display. Eight digital inputs and eight outputs capable of driving up to 200-mA loads at 24 V can be monitored and controlled from the front panel and RS232/IEEE-488 interfaces. The Model 200 sells for \$2790. *Palo Alto Research, 953 Industrial Avenue, Suite 111, Palo Alto, California 94303*
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New Literature

Vacuum classics—The American Vacuum Society in conjunction with the American Institute of Physics is offering the first four books in the *AVS Classics Series in Vacuum Science and Technology*. The series consists of reissues of out-of-print books with continuing impact. The four titles now available are *Field Emission and Field Ionization*, *Handbook of Electron Tube and Vacuum Techniques*, *The Physical Basis of Ultrahigh Vacuum* and *Vacuum Technology and Space Simulation*. They cost \$35 each, but they will be available for \$24.50 each at the 40th AVS National Symposium in Orlando, Florida, in November. *American Vacuum Society, 335 East 45th Street, New York, New York 10017* ■

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