

**A CALL
FOR PAPERS**

COMPUTERS IN PHYSICS

*A new periodical
from the
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of Physics*

Computers in Physics, a combination magazine and peer-reviewed journal published bimonthly by the American Institute of Physics, is soliciting papers on computer use in physics and astronomy.

We are interested in papers which describe novel ways physicists have applied computers to their work in the lab or the classroom, as well as details of original research about computer applications in related fields such as optics, acoustics, geophysics, rheology, crystallography, vacuum science, and medical physics.

Please address all papers for this new publication to Robert R. Borchers, Editor, **Computers in Physics**, PO Box 5512, Livermore, CA 94550. Papers should be organized according to the American Institute of Physics Style Manual.

**COMPUTERS IN
PHYSICS**

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.

CW Broadly Tunable Ti:Sapphire Laser

The new Model 3900 from Spectra-Physics is described as the first commercially available cw tunable Ti:sapphire laser. It delivers a peak output power of 2.5 W with broad tunability from 700 to 1000 nm. Two mirror sets cover this unusually broad tuning range. The laser's cavity is designed to provide maximum optical output whether it is pumped by large-frame or small-frame ion lasers.

This solid-state laser is claimed to offer dependability, ease of use and long life. Its very broad tuning range eliminates the downtime associated

high-power laser systems. Because of their structural strength, sapphire windows can be made much thinner than other common dielectric windows, thus providing better transmittance. Sapphire is a single-crystal aluminum oxide. It is useful for transmission in the visible and infrared wavelength range from 0.15 to 5.5 microns. *Edmund Scientific, 101 East Gloucester Pike, Barrington, New Jersey 08007*

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AC-DC Wheatstone Bridge with Extended Linearity Range

Edinboro's Model ECI-589-LB is a linear Wheatstone bridge that employs novel circuitry to overcome the inherent nonlinearity of conventional bridges. The circuitry is encased in a small, board-mounting module. While ordinary Wheatstone bridges are approximately linear only in the small region of balance, the Edinboro bridge is claimed to maintain linear output within 0.5% as the sensor arm varies over the impressive range from zero to four times its nominal value. The manufacturer also offers "premium" versions that are linear within 0.1% over the entire range. No potentiometer adjustments are necessary to achieve this level of performance.

The module can be used as the basic element of measuring instruments such as mass flow meters, differential pressure gauges, thermometers, strain gauges, load cells and optical meters.

With ac excitation, the Model ECI-589-LB can be used to construct precision impedance bridges, with the variable arms serving as inductances or capacitances. It can also do linear amplitude modulation or phase modulation of a carrier frequency. The module measures 3" x 4" x 0.65". It requires ± 12 to 15 volts dc as well as



with changing dyes. It is also said to be much cheaper to maintain than dye lasers. The Model 3900 is intended for a broad range of applications, including general spectroscopy, Raman experiments in the near infrared, pumping of new solid-state laser materials and medicine. *Spectra-Physics, 1250 West Middlefield Road, P.O. Box 7013, Mountain View, California 94039-7013*

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Single-Crystal Sapphire Windows

Edmund Scientific is offering single-crystal sapphire windows for applications that require their extreme surface hardness, high thermal conductivity, high dielectric constant or their resistance to acids and alkalis. They are used, for example, with

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an external dc or ac bridge excitation source. The price of Edinboro's linear Wheatstone bridge is \$295. *Edinboro Computer Instruments, 13160 Water Street Extension, P. O. Box 819, Edinboro, Pennsylvania 16412*

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Pulsed 50-Joule Nd:Glass Infrared Laser

Lasermetrics has introduced a pulsed Nd:glass laser that puts out 50 joules at an infrared wavelength of 1.062 microns with a repetition rate of 1 Hz. Its pulse width is 1 millisecond.

The Model 936G4L was developed for studies of thermal diffusivity. It can also be used for fluorescence spectroscopy and for a variety of other applications requiring high-energy, near-infrared laser pulses. The instrument's modular optical components are mounted to a rail assembly for stability, ease of alignment and versatility. The output beam diameter is 12.5 mm, with a divergence of 5 mrad.

Accessories for the Model 936G4L include Nd:glass amplifiers for more energy, electro-optic Q-switches and pulse extractors for shorter pulse widths, photodetectors for monitoring, beam expanders for improved beam divergence, and a variety of focusing and deflection optic components for beam positioning. The price is \$27 000. *Lasermetrics, 3500 Aloma Avenue, Building D-9, Winter Park, Florida 32792*

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Turbomolecular Pumps with Magnetic Upper Bearings

Balzers has introduced a new family of turbomolecular pumps with magnetic upper bearings designed to minimize friction, vibration and power consumption. These Series 060, 240B and 520 turbomolecular pumps also offer fully machined rotor blades and precision-ball lower bearings lubricated by recirculating oil. The vibration is claimed to be less than 0.005 microns. The pumps offer two-speed or variable-speed operation. They can pump all gases, including helium and hydrogen, and they are built to withstand atmospheric inrush accidents.

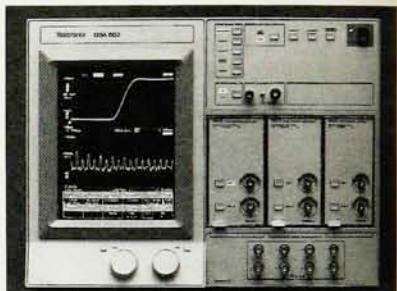
The new Balzers pumps use replaceable felt oil modules to facilitate oil changes. Midstage venting pro-

motes cleanliness and longevity. The pumps incorporate dc synchronous drive systems that are said to run cool with no slippage. The drive systems serve as a generator to power delayed vent valves. Housings and flanges are all stainless steel. *Balzers High Vacuum, 8 Sagamore Park Road, Hudson, New Hampshire 03051*

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Ultrafast Digitizing Signal Analyzer

Tektronix is introducing a new class of instruments, which the firm calls digitizing signal analyzers, for acquiring, measuring and analyzing ultrafast transient or repetitive signals instantly. The new line includes the DSA 601 and the more expensive DSA 602—a 2-gigasample/second instrument with 1-GHz bandwidth, 8-bit vertical resolution, 32-kilobyte record length, 12 acquisition channels and a



color display. Both models achieve vertical accuracy of 1% and time-base accuracy of 0.005%.

Aside from signal acquisition, measurement and display, the DSA 600 series executes waveform-processing functions up to 180 times per second. Signal processing functions include fast Fourier transform, point-by-point pass-fail testing, averaging, smoothing, interpolation, integer and floating-point arithmetic, signal de jitter and envelope acquisition. The price of the DSA 601 is \$21 025; the DSA 602 sells for \$27 125. *Tektronix, P. O. Box 500, Beaverton, Oregon 97077*

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North American Geophysics Compact Disc

The National Geophysical Data Center is releasing a read-only memory compact disc entitled "Geophysics of North America." Data compilations and displays are included on topography, magnetics, gravity, satellite imagery, seismicity, crustal stress,

NEW PRODUCTS

thermal aspects and geopolitical boundaries.

The data coverage spans the Northern Hemisphere from approximately the prime meridian westward to the International Date Line. Access software provided with the CD-ROM helps the user to output and view the data. Color presentations are in map, profile and point-value formats.

The software runs on the IBM PC/AT or compatible computers with 640 K of RAM, MS-DOS CD-ROM extensions, and EGA or VGA graphics. The CD-ROM with software is priced at \$580. *National Geophysical Data Center, NOAA (Code E/GC, Department 742), 325 Broadway, Boulder, Colorado 80303*

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Memory Upgrades for VAX Systems

Clearpoint, a producer of VAX-compatible memory, offers a new series of memories in 8-MB, 12-MB and 16-MB stackable array cards compatible with the VAXstation 3100. This DCME-M31 series allows users considerable flexibility in configuring both Model 30 and Model 40 systems to a total memory capacity of 16, 20, 24 or 32 MB. Model 30 users can preserve their initial investment in DEC's 4-MB array cards by using them in conjunction with Clearpoint's 8-MB and 16-MB array cards.

The stackable array cards of the DCME-M31 series connect to the CPU board of the VAXstation 3100 via Digital's factory-installed connectors. Prices for the cards range from \$5400 to \$9600. *Clearpoint Research, 35 Parkwood Drive, Hopkinton, Massachusetts 01748*

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Three-Channel High-Voltage Piezoelectric Drive

Burleigh's new PZ-73 three-channel high-voltage amplifier is designed to drive as many as three high-voltage piezoelectric actuators. The PZ-73 offers three totally independent 25-mA output channels at selectable voltages of 0 to +1000 V, 0 to -1000 V, and -500 to +500 V.

Output voltages can be set manually using the three front-panel gain controls, or they can be controlled by the 0-10-V input voltage for each channel. This unit offers variable gain up to 100 and automatic current limiting. The amplifier can reach a

gain-bandwidth product of 3 MHz while maintaining a gain error of less than 1% at 10 kHz. Each channel on the PZ-73 has individual response and damping controls that allow one to optimize the amplifier's ac characteristics for reactive or resistive loads anywhere in its voltage range. *Burleigh Instruments, Burleigh Park, Fishers, New York 14453*

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Gain-Switched High-Pulse-Power YAG Microlaser

The Amoco Laser Company has introduced a gain-switched, diode-pumped YAG microlaser. It emits at an infrared wavelength of 1320 nm, with peak power up to 1.7 W. The laser pulses are triggered by an external TTL signal applied to a BNC connector on the power supply. Pulse rates



range from 100 Hz to 10 kHz. Typical pulse widths are 500 nsec, with an energy of 1.4 μ J per pulse.

The laser head is 14.6 cm long and 4.5 cm in diameter; it weighs about 400 g. The longer, flatter pulses made possible by gain switching are useful for fiberoptic testing and a variety of research applications. *Amoco Laser Company, 1251 Frontenac Road, Naperville, Illinois 60540*

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New Literature

Vacuum catalog—The Physical Electronics Division of Perkin-Elmer is offering its new 1989-90 ultrahigh-vacuum equipment catalog, with 168 pages of detailed information on its complete line of vacuum products. Included are systems and chambers, ion pumps and controls, measuring instruments, valves, roughing devices, flanges, fittings and feed-throughs. *Perkin-Elmer Physical Electronics, 6509 Flying Cloud Drive, Eden Prairie, Minnesota 55344*

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