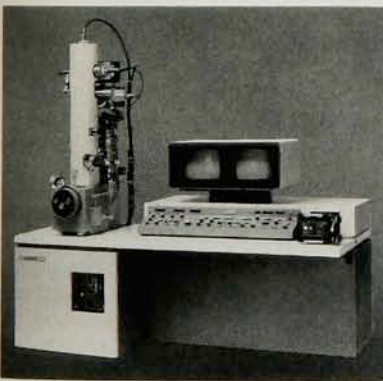


The descriptions of the new products listed in this section are based on information supplied to us by the manufacturers, and in some cases by independent sources. PHYSICS TODAY can assume no responsibility for their accuracy. To facilitate inquiries about a particular product, a Reader Service Card is attached inside the back cover of the magazine.

Field-Emission Scanning Electron Microscope

The new DS-130F field-emission scanning electron microscope from International Scientific Instruments offers a combination of high resolution and large-sample handling capability. The DS-130F is a dual-stage microscope that provides nanometer resolution in its top stage and large-specimen handling (while maintaining 2-nm resolution) in the bottom stage. Even at 1 kV electron-beam energy, the new microscope provides 4-nm and 10-nm resolution in the top and bottom stages, respectively.

In its standard configuration, the DS-130F accommodates samples as large as 6 inches in diameter. An optional motor-driven stage can handle samples up to 8 inches. These stages, combined with the instru-



ment's true conical lens, permit high-resolution imaging even when large samples, such as integrated-circuit wafers, are tilted at steep angles.

Technical advances incorporated into the DS-130F scanning electron microscope include a newly developed condenser lens system and a high-brightness, thermal field-emission gun. In its vacuum requirements, this new field-emission gun is much less demanding than are cold field-emission sources. It operates in the

10^{-8} -torr range. A further advantage is the emission current's high stability, which makes tip flashing unnecessary. This is claimed to be an especially important feature for high-accuracy quantitative x-ray analysis. The price of the DS-130F system is \$24 500. *International Scientific Instruments, 1457 McCarthy Boulevard, Milpitas, California 95035*

Circle number 140 on Reader Service Card

Three-Dimensional Laser Microscope for Surfaces

Zygo has introduced the Maxim 3D three-dimensional noncontact laser microscope for the measurement of surface structure. Its optical design allows it to measure carbon-overcoated surfaces as easily as polished aluminum substrates.

Combining the capabilities of an optical microscope with the measurement resolution of phase-measuring interferometry, the Maxim 3D can perform vertical, lateral, angular and positional measurements to 6-angstrom vertical resolution and less than 0.5-micrometer lateral resolution. Three-dimensional measurements allow accurate analysis of surface defects, which can be located at low magnification, then measured at higher magnification by rotating the turret.

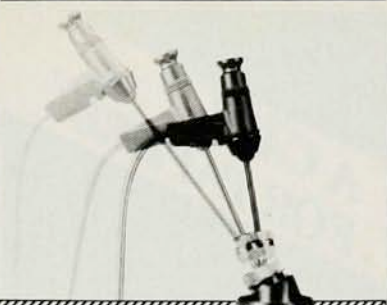
The system's software is said to be easy to use. Custom programs allow it to perform dedicated, repeated measurements with one key press. *Zygo Corporation, Laurel Brook Road, Middlefield, Connecticut 06450*

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High-Power Klystrons for Large Tokamaks

The new TH 2103 high-power klystron from Thomson Electron Tubes is particularly suited for tokamak research. It can deliver more than

RVI we've made it a science



See inside vacuum or pressure vessels

Remote Visual Inspection (RVI) with Olympus rigid and flexible scopes lets you see magnified, brilliantly lighted images inside vessels under vacuum or high pressure. You will be able to observe and record objects and phenomena, at close range, that you never could before.

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Image analysis. Scope images can be seen on a video monitor for observation by groups and for documentation. Olympus systems let you digitize color images and perform analysis, including measurement to one part in 1024, gray scale histograms, image enhancement, particle counts, area calculations, and much more.

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**A CALL
FOR PAPERS**

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*A new periodical
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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**

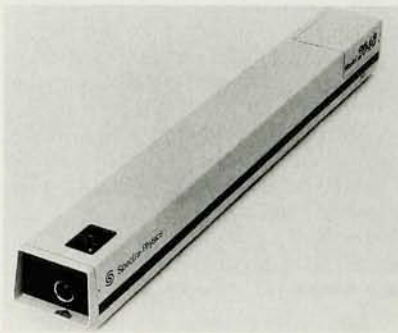
650 kW of 3.7-GHz rf power in 10-second pulses, with a gain of 50 dB. The tube has been selected as the lower-hybrid resonance heating source for the French tokamak at Cadarache. A variant of this klystron (TH 2103A) produces 500 W of cw power at the same frequency for the large JET tokamak in England.

To ensure reliability and long life, these klystrons have impregnated-tungsten cathodes and two integral ion pumps. The beam current is adjustable by anode modulation, allowing the tube characteristics to be optimized with aging. The klystrons have a five-cavity design, with collector cooling by Thomson's proprietary Hypervapotron. The TH 2103 and TH 2103A are optimized to withstand high and fluctuating standing-wave ratios, such as the ones encountered with plasma loads. X-ray shielding is built in. *Thomson Electron Tubes, 38, Rue Vauthier, 92100 Boulogne-Billancourt, France*

Circle number 142 on Reader Service Card

Ion Lasers in the Visible and Ultraviolet

Spectra Physics is offering what it describes as "the highest power available in a commercial argon ion laser." This new Model 2040, introduced in November, is an ultraviolet-enhanced laser providing up to 7 W of mid-uv and 1.5 W of deep-uv output, along with 25 W in the visible. The 2040 has a very compact power supply, which can be placed underneath a standard optical table. A hand-held remote control provides analog and digital displays and peak power readout. The laser's wide-bandwidth photodetector electronics, we are told,



yield stabilized, low-noise light output and accurate power readout across the spectrum, from the deep-uv to the near ir.

Spectra Physics has also recently introduced the Stabilite 2016 series of scientific ion lasers. They provide up

to 6 W of power in the visible and 100 mW in the ultraviolet, in a compact and stable coaxial resonator package. This new configuration provides exceptional beam pointing stability and rapid warm-up, we are told. It is virtually unaffected by changes in water or air temperature. Krypton versions are available with output power up to 600 mW. *Spectra Physics, 1250 West Middlefield Road, P.O. Box 7013, Mountain View, California 94039-7013*

Circle number 143 on Reader Service Card

Scanning Tunneling Microscope for Non-uhv Applications

Angstrom Technology has introduced its second-generation scanning tunneling microscope system, the TAK 2.0. This integrated microscope system, designed for applications that do not require ultrahigh vacuum, allows complete atmospheric control and easy introduction of fluids into a special cell for electrochemistry and biology.

The system includes a fast computer based on "transputer" technology, which offers rapid data acquisition and sophisticated image processing in parallel. This menu-driven computer, which automatically controls the approach of the scanning tip to within tunneling distance from the sample, also includes a built-in potentiostat. The single-scan head provides atomic resolution for scans up to 12×12 microns.

The system includes the microscope, the computer, peripherals (including input and output monitors, a thermal printer, keyboard and a mouse), a video microscope system with on-screen tip-sample display, an acoustic isolation system, an electrochemistry cell and tips. The price for the total system is \$60 000. *Angstrom Technology, 1815 West First Avenue, Suite 102, Mesa, Arizona 85202*

Circle number 144 on Reader Service Card

Microanalysis by Electron Microscope and Spectrometer

Philips Electronic Instruments has introduced a new analytical system for quantitative microanalysis and scanning electron microscopy. This new Phax-Scan system is a functionally integrated scanning electron microscope and energy-dispersive spectroscopy system designed to exploit the analytical capabilities of the

firm's Series 500 scanning electron microscopes. The system is claimed to be particularly convenient and fast for a wide range of microanalytical applications, including quantitative digital x-ray mapping, digital line scanning and particle analysis. The system can typically complete an analysis of 2000 particles in less than 20 minutes.

The Phax-Scan's processing capabilities allow it to reduce data considerably faster than rival systems, we are told. Matrix-corrected line scans for as many as 16 elements can be simultaneously obtained within minutes. The system's high data-reduction speed lets it do point-by-point corrections for atomic number, absorption and fluorescence, making it possible to analyze heterogeneous samples accurately.

A complete range of microanalytical software is available, including programs for full quantitative analysis, digital x-ray mapping, digital line scanning, unattended analysis, three-dimensional metrology, particle analysis, library sorting and random analysis. *Philips Electronic Instruments, 85 McKee Drive, Mahwah, New Jersey 07430*

Circle number 145 on Reader Service Card

Pulse Generator for Electrical and Optical Outputs

The new Model 6040 from Berkeley Nucleonics is a 100-MHz universal pulse generator. This test generator provides a variety of electrical and optical pulse outputs. Its versatility is obtained by means of a programmable mainframe employing plug-in



modules. The electrical modules provide ± 5 -V pulses with 150-psec transition times, ± 300 -V pulses with 5-nsec rise time, or low-jitter time delays with 1-nsec resolution. The optical modules provide independently controllable peak and baseline

power, modulation of light up to 750 MHz and subnanosecond impulses. Available wavelengths include 830, 1064, 1300 and 1550 nm.

It is unusual, we are told, for a 100-MHz pulse generator to have accuracy specifications better than 3%. The Model 6040 claims 0.2% accuracy for delay and width and 0.01% accuracy for frequency. The jitter between an external trigger and the output pulse is specified to be less than 25 psec. Other salient features include a timing range from 1 nsec to 640 seconds, a 35-nsec insertion delay, full programming from GPIB or RS232 buses, and storage and recall of ten parameter sets. Applications include testing the new high-speed GaAs logic families and driving Pockels cells and high-voltage switches. The price of the Model 6040 mainframe is \$4250. Modules range from \$2100 to \$10 750. *Berkeley Nucleonics, 1121 Regatta Square, Richmond, California 94804*

Circle number 146 on Reader Service Card

Galvanometer Scanners for Optical Mirrors

Cambridge Technology has introduced its Model 6000 series of galvanometer scanning systems. They are designed to drive a wide range of mirrors at speeds up to several hundred scans per second. These feedback control systems can follow any specified scanning waveform—sawtooth, triangle or sinusoid—or they can execute random steps with great speed and precision.

These scanners employ moving-coil galvanometers that provide excursion angles up to 40° and millisecond step responses for 1-inch-square mirrors 3 millimeters thick. The ability to drive large loads quickly lets one use inexpensive mirrors to achieve good flatness specifications. Integral, capacitive position transducers provide zero and scale-drift coefficients to a few parts per million without the need for thermal blankets. Position signal resolution is better than 1 arc-second, and nonlinearity is claimed to be less than 0.025% over the full 40° excursion.

These systems include galvanometer, rack-mounting electronics and cables. Mirrors and mounts must be ordered separately. The single-quantity price for a complete system with rack-mounting electronics is \$4000. *Cambridge Technology, 23 Elm Street, Watertown, Massachusetts 02172*

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Quick & Easy Superconductivity Measurements



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