

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.

Tunable Diode Laser in the Visible

New Focus has developed a new line of continuously tunable diode lasers. The firm describes its Model 6102 as "the first commercially available tunable diode laser in the visible."

Tunable external-cavity diode lasers provide an extremely stable and narrow linewidth output that can be tuned continuously, without mode hopping, over a wide wavelength range. The output of the Model 6102 is centered at 670 nm, with 10–100 KHz bandwidth and tunability over a range of more than 12 nm. New Focus will soon introduce tunable diode lasers at other wavelengths, we are told. The stability of the diode laser itself is quoted as ± 5 mK. The



current controller has an rms current noise of less than 100 nA. Front-panel modulation up to 1 MHz can be done without affecting the frequency noise. The piezoelectric driver circuitry permits analog tuning rates of 240 GHz/sec. This eliminates stepwise tuning with stepper motors.

These lasers are designed to replace tunable lasers in such applications as spectroscopy, isotope separation or photodynamic medical therapy. In process control, they should provide higher power and spectral brightness than traditional sources such as hollow cathode tubes. By superheterodyning two of these lasers, it is also possible to generate millimeter wave radiation. The Model 6102 sells for \$15 000. *New Focus, 340 Pioneer Way, Mountain View, California 94041*

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New Version of Wolfram's Mathematica

Wolfram Research's software system *Mathematica* is now available in version 2.1. *Mathematica* 2.1 offers higher speed, significantly lower memory requirements, enhancements to its external communications protocol, and other improvements over *Mathematica* 2.0, the previous version.

The greater speed of *Mathematica* 2.1 is most evident in functions such as calculating linear equations, rendering contour graphics, generating graphical output and performing certain input commands. Memory requirements to run *Mathematica* 2.1 have been reduced by as much as 50%. Ten new *Mathematica* packages have been added, including ones that handle nonlinear fitting, binary file manipulation and Dirac delta functions. Enhancements have also been made to existing *Mathematica* packages, including new publication-quality graphics functions and extensions of Laplace and Fourier transforms.

The Microsoft version fully supports Windows 3.1. The Macintosh version of *Mathematica* supports QuickTime, Apple Computer's software architecture for animation interchange among Macintosh applications. *Wolfram Research, 100 Trade Center Drive, Champaign, Illinois 61820*

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Astigmatic Multipass Absorption Cell for Spectroscopy

Aerodyne has introduced a new astigmatic multipass absorption cell for tunable diode-laser spectroscopy, atmospheric-trace gas monitoring and the determination of eddy correlations in trace-gas flux measurement.

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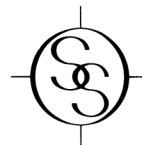
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The cell provides a 100-meter path length within a 3.2-liter volume. Its astigmatic mirrors produce a spot pattern that minimizes interference fringes.

A proprietary optical design makes it possible to compensate for mirror radius imperfections. An aerodynamic flow option minimizes sample residence time. A more compact (36-m path, 0.5-liter) version is intended for small samples, rapid sampling and space-constrained instrument packages. *Aerodyne Research, 45 Manning Road, Billerica, Massachusetts 01821-3976*

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Electromagnetic Design and Analysis Software

The new MagNet 5 software from Infolytica is a complete revision of the firm's electromagnetic analysis system. Enhancements introduced in this fifth version include a new intuitive OSF/Motif style interface, X Window support on PCs and UNIX machines, an object-oriented modeling method, a graphical circuit editor and hierarchical solvers. The new MagNet 5 interface uses multiple windows, push buttons, pull-down menus and dialogue boxes to guide the user. X Window support on all machines, including PCs, provides the basis for system-independent software that can run the same file and interface structures on all platforms. This allows multiple users to share data, even if they are on different platforms. It also allows users to run MagNet on a desktop machine for model building and results analysis, and then on a faster remote machine for solution.

MagNet 5's object-oriented modeling method lets the user build primitive devices and then assemble them into a final model. Later changes to primitive devices are then reflected in the complete devices. This facilitates design variation and tolerance studies. Libraries of primitive devices can be built and used as required. A graphical circuit editor lets varied voltages and currents be defined visually for multiple circuits with various elements. MagNet 5's Scalar-Potential Edge Element solvers are written for electromagnetic applications. Their hierarchical elements make for greater accuracy in a given computing time.

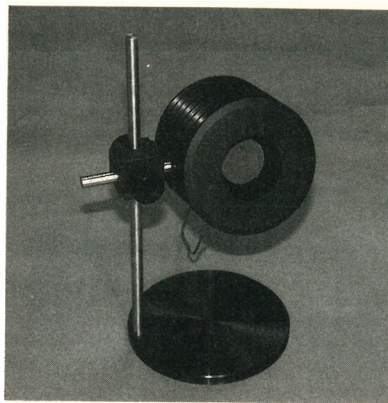
MagNet 5 is structured to be analogous to laboratory testing, allowing fast variations in physical shapes,

materials and excitations. Typical applications include the design and nondestructive testing of electrical machines, inductors, actuators, sensors, recording heads and magnetic-resonance imaging systems. MagNet 5 is available on all currently supported hardware platforms, including 386/486, HP, Sun, Apollo, DEC, IBM and Cray. *Infolytica, 1140 de Maisonneuve, Suite 1160, Montreal, Quebec, Canada H3A 1M8*

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Large-Area Excimer Laser Power Probe

Moletron has introduced its new Powermax Model PM150X, a large-area probe for use with high-power excimer lasers. This 50-mm diameter probe can handle 150 watts of continuous power and up to 300 watts of intermittent power at wavelengths of 193 nm, 248 nm, 308 nm and 351 nm. Its maximum tolerable pulse energy density is specified at 0.5 J/cm² for a



20-nsec pulse at 193 nm. Like the firm's other Powermax probes, the PM150X includes NIST traceable calibration and intelligent interconnection. It is compatible with Moletron's PM5100 analog power meter and the PM5200 analog/digital power meter. *Moletron Detector, 747 Southwest Bridgeport Road, Portland, Oregon 97224*

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16-Channel Programmable-Gain Amplifier

R. C. Electronics describes its new programmable-gain amplifier, the Model RCI-PGA, as "the industry's first true multichannel instrumenta-

NEW PRODUCTS

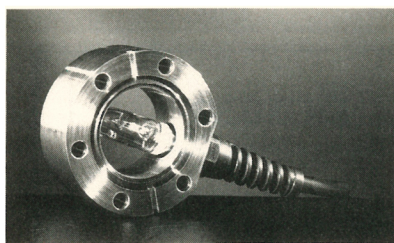
tion amplifier." It has a frequency response of 200 kHz for all of its gain ranges. Reduction of common-mode noise is provided by its differential inputs. An ac option is available to provide a floating input, so that one can measure differences in high voltage signals. Gains from 1 to 200 are individually programmable.

The software-programmable RCI-PGA board can be housed in a personal computer or in an external chassis. One can package multiple RCI-PGA boards in a chassis for up to 128 channels per box. This lets the system work with just about any bus-based data acquisition system. The user programs the RCI-PGA either through the PC bus or directly via an external TTL clock and serial data line. Menu-driven and C-driven software for the PC are provided with the system. *R. C. Electronics, 6464 Hollister Avenue, Goleta, California 93117-3110*

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Starting Device for Cold-Cathode Vacuum Sensors

The HPS division of MKS Instruments is introducing the SensaVac IgniTorr, a proprietary starting device for cold-cathode sensors on vacuum gauges. The IgniTorr is a two-sided 2 $\frac{3}{4}$ " CF flange with an ultraviolet-glass finger. The finger emits photons, which in turn release electrons from the sensor's cathode to



initiate the ionization process. IgniTorr functions at any pressure level, and it is constructed of materials suitable for ultrahigh-vacuum applications. *HPS, 5330 Sterling Drive, Boulder, Colorado 80301*

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Simulating the Physics of Semiconductor Devices

Dawn Technologies is offering a new semiconductor-device physics simulator called Semicad Device, which pro-

vides two-dimensional simulation of a wide range of semiconductor technologies. Semicad Device can simulate MOS and bipolar devices as well as compound semiconductor systems such as MESFET, HBT, HEMT and optoelectronic devices. Users can create their own physics models and material libraries.

Semicad Device uses a simulation control language called Sim-C. This language lets end users automate complex simulation analysis. Sim-C also lets the user customize data analysis, data interfacing and graphics. An interactive data visualization package is included with the simulator. Semicad Device is available for UNIX workstations. University discounts are available.

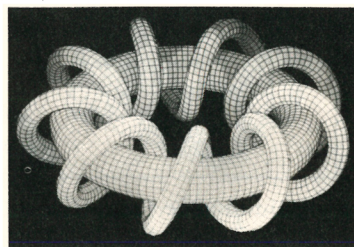
Semicad Device can simulate the dc, ac or transient electronic performance of an arbitrary two-dimensional topology of semiconductors, conductors, insulators and terminals. The topological capability of Semicad Device makes it attractive for simulating complex semiconductor device structures such as parasites. Three physics options can be added to the main simulator: The Heterocomp option simulates heterostructure devices, including abrupt heterojunctions and arbitrary spatial variation of semiconductor composition. The Traps physics options provides full dynamic simulation of multiple traps. This option is recommended for accurate simulation of surface states, deep levels, crystal defects, low temperatures, high frequencies or variable carrier lifetimes. The Photorad physics option provides analysis of free-carrier generation from optical beams or ionizing radiation. Photorad includes optical beam ray tracing and multiple optical wavelengths to facilitate rapid analysis of photodetector applications. *Dawn Technologies, 491 Macara Avenue, #1002, Sunnyvale, California 94086*

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New Literature

Optics—Edmund Scientific's 204-page 50th anniversary catalog lists some 8000 optical and industrial products. It highlights Zygo's new Mark IV phase-shift interferometer, the centerpiece of Edmund's optical testing program. The catalog lists mirrors, flats, corner cubes and other rigorously tested optical components. It also includes microscopes, telescopes, magnifiers and a variety of lab equipment and accessories. *Edmund Scientific, 101 East Gloucester Pike, Barrington, New Jersey 08007* ■

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