

# 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.

## FOCUS ON OPTICAL DESIGN SOFTWARE

### Optical Design Software with Diffuse Capabilities

Opticad Corp. has released version 3.3 of its Opticad computer-aided optical design software. Opticad models three-dimensional optical systems consisting of a broad variety of mirrors, lenses, reflective surfaces, sources and detectors. The user can alter surfaces by changing their reflectance and transmission, and by adding ellipsoidal or rectangular holes, diffraction gratings and polynomial aspherics. New features in version 3.3 include the ability to treat diffuse surface scattering and to model devices such as photocopiers, integrating spheres, laser welders and projection televisions.

Opticad's ray-tracing algorithm does not constrain the order in which rays encounter different elements in the optical system, so it automatically takes into account such phenomena as multiple surface intercepts and total internal reflection, which may radically change ray paths. Results can be presented in a number of formats, including tables, three-dimensional graphical views and Microsoft Excel-compatible files. Opticad runs on personal computers having a 386 or higher processor, Windows NT, Windows 95 or Windows 3.1 and Win32s, 8 megabytes of RAM, 8 Mbytes of Windows memory, 2 Mbytes of hard disk space and a graphics board that handles at least 256 colors. *Opticad, P.O. Box 10123, Santa Fe, NM 87504-6123*

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### Optics Design Software for Students and Systems Engineers

Oslo Light from Sinclair Optics is a simplified package of 32-bit, C-language optical design programs in-

tended for new users, students and systems engineers. The package can handle three-dimensional spherical and aspherical surfaces, gradient index elements, diffractive surfaces and binary surfaces, even when the elements are tilted or decentered. The ray-tracing algorithm uses aplanatic ray aiming and has field and aperture coverages of greater than 90°. The package includes Gaussian beam analysis and fiber optics coupling efficiency, and output can be presented in report-quality graphics. The package runs under all current versions of Windows and is compatible with the company's more advanced optical design software. A trial version of Oslo Light is currently available free of charge. *Sinclair Optics, 6780 Palmyra Road, Fairport, NY 14450*

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### Optical Analysis Software with Energy Visualization

Breault Research Organization's ASAP 5.0 is said to provide three-dimensional modeling of light from almost any source and in a broad variety of applications. The program models photon propagation in three dimensions, including scattering, interference, refraction and reflection, using a Gaussian beam superposition algorithm. It can analyze existing designs or generate new ones, and it can also analyze diffraction effects, stray light phenomena, ghost images and photon herding. ASAP includes integrated spreadsheets and dialog boxes for constructing and editing system geometries. Its on-line help facility is context-sensitive, and its ray-tracing algorithm provides enhanced visualization of energy distribution. *Breault Research Organization, 6400 East Grant Road, Suite 350, Tucson, AZ 85715-3862*

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## HELIUM-3 SYSTEMS



For research applications requiring temperatures down to 0.3 K, Janis Research offers self contained sorption pumped or continuously operating He-3 systems. These systems are designed to hold He-3 from several hours to two days or more.

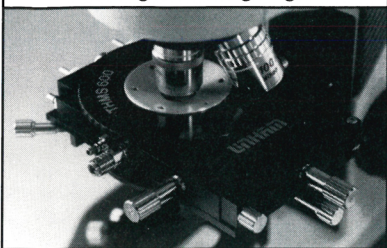
Sorption pumped systems feature several configurations:

- Sample in vacuum with a sealed self contained inventory of He-3.
- Sample in liquid with top loading sample probe, vacuum lock, and external He-3 gas handling system.
- Optical access to sample either in liquid or vacuum.

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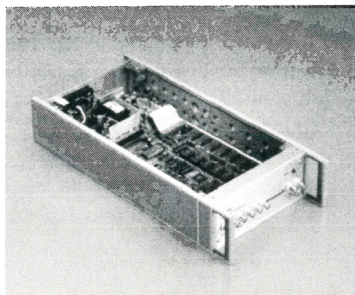
**Microscopy Techniques**

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**Simulation Software  
for Surface-Emitting  
Diode Lasers**

Crosslight Software's Pics3D software provides three-dimensional simulation of laser diodes and related photonic circuits, especially vertical cavity surface-emitting lasers. The program models VCSELs using the drift-diffusion model, and it gives a self-consistent three-dimensional treatment of longitudinal modes and the optical field distribution. Thermal modes are also automatically included. These features make it possible to optimize the material and geometric parameters of the device for a given application. The program is expected to be especially useful in optoelectronics. *Crosslight Software, P.O. Box 27102, Gloucester, Ontario K1J 9L9, Canada*

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**Simulation Program  
for Electron and  
Ion Optics**

Princeton Electronic Systems' Simion 3D version 6.0 is a program for simulating the behavior of electron and ion optics systems, such as mass spectrometers and electron lenses. The program's graphical user interface allows the user to define up to 200 two- and three-dimensional arrays, with up to  $10^8$  points in a volume of up to  $8 \text{ km}^3$ . The arrays can be viewed in cross section to map particle trajectories or potential energy surfaces. Ions or electrons can be flown singly or in groups, and their trajectories displayed as flying dots or lines. Those who purchase Simion 3D during 1996 will receive all upgrades introduced before June 1997 free of charge. *Princeton Electronic Systems, P.O. Box 8627, Princeton, NJ 08543-8627*

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**Modular Design  
Software for  
Optics and Photonics**

Advanced Photonics International has made available Solstis 3.1, a modular series of optics and photonics design routines from the French firm Optis. Solstis can render drawings of simulated systems either with or without traced rays of up to seven wavelengths. Using the two-dimensional version, Solstis 2D++, one can do ray tracing

and simulate systems with thick lenses, gratings, aspherical surfaces and chromatic aberrations. Solstis 3D++ can also treat gradient-index lenses, x-y polynomial surfaces, lens arrays, real Fresnel lenses and holographic elements. Optional modules allow the user to simulate incoherent light sources, coherent light sources, and incandescent, fluorescent and arc lamps. Other optional modules allow simulation of elements such as waveguides and photometric systems. *Advanced Photonics International, 54 Plymouth Road, White Plains, NY 10603*

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**Electromagnetic  
Software Using  
Neural Networks**

Infolytica's MagNet 5.2 is an electromagnetic problem-solving program that uses neural networks to determine the optimum problem-solving geometry from previous solutions. This is said to decrease solution time and increase solution accuracy. The new version of the software uses a one-step, tunable Maxwell stress method for calculating torques and force, an open-boundary method that takes far or stray fields into account and three-dimensional impedance boundary conditions that make it possible to reduce the size of a model. It also contains three-dimensional iron plate elements, which allow simulation of magnetic shielding, transformers and related devices. Other features include automated file management and enhanced links to coupled problems. MagNet runs under Windows and Unix operating systems. *Infolytica, P.O. Box 1144, Place du Parc, Montreal, Quebec H2W 2P4, Canada*

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**Statistics Package  
for Mathematical  
Analysis Program**

The Mathworks has released its Statistics Toolbox 2.0 for use with the company's Matlab mathematical software. The toolbox provides more than 200 statistics functions, including routines for probability distributions, parameter estimation, multivariate statistics, linear and nonlinear modeling,



experimental design and principle components analysis. The toolbox uses Matlab graphics and computational routines and is expected to be useful for users of Matlab in the aerospace and communications industries. In combination with the company's signal processing and image analysis toolkits, the Statistics Toolbox has been used to analyze the three-dimensional topography of optical surfaces. *The Math Works, 24 Prime Park Way, Natick, MA 01760-1500*

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## Neural Network Design Software with Genetic Algorithms

The Neurogenetic Optimizer 2.0 from Biocomp Systems is a neural-network development program that uses so-called genetic algorithms to optimize the inputs to and structure of a neural network. In the genetic algorithm, several solutions for the optimum neural network are generated and judged according to how well they agree with a given data set. The user chooses one of five tests by which to judge agreement: relative accuracy, R-squared, mean-square error, root-mean-square error and average absolute error. Those solutions that best agree with the data are saved, and various attributes of them are combined to generate new solutions; this process repeats until an optimum solution is found. The new version of Neurogenetic Optimizer supports several types of neural networks and is said to feature a more robust optimization method. It runs under Windows 95 or Windows NT, and a 16-bit version is available for Windows 3.1. The routine should find applications in functional modeling and studies of process faults. *Biocomp Systems, Overlake Business Center, 2871 152nd Avenue NE, Redmond, WA 98052*

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## Matrix-Based Programming Language for OS/2 and Windows

Gauss, the matrix-based programming language from Aptech Systems, is now available in versions for OS/2, Windows 95 and Windows NT. Because Gauss assumes that the elements involved in calculations are matrices, it allows the user to write code without loops. Op-

erations can be specified either interactively or as executable programs. Gauss for OS/2 and Windows includes a source-level debugger, a library with more than 400 functions, sparse-matrix routines and a foreign language interface that allows a program to call compiled C and Fortran routines. The language also supports 32-character variable and function names, complex numbers and character string arrays. Graphics routines present data in two-dimensional, three-dimensional, surface, contour, polar and other formats. Plots can be exported as PCX, PIC, HP-GL/2, Postscript and EPS files. Gauss is said to be especially useful for solving large-scale problems, including spectral analysis, simulations and systems of differential equations. *Aptech Systems, 23804 SE Kent-Kangley Road, Maple Valley, WA 98038*

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## Mathematical Software for Windows Operating Systems

Civilized Software's Mlab mathematical and statistical modeling software is now available in a version that runs under both Windows 95 and Windows 3.1. Because the new version takes advantage of Windows' use of virtual memory, it can accommodate larger arrays than could the previous version for DOS. The new version's help system is also said to be significantly expanded. Mlab's library contains over 450 built-in functions, and the program should be useful in simulation, modeling, solving differential equations of any order and constrained nonlinear optimization. *Civilized Software, 7735 Old Georgetown Road, Suite 410, Bethesda, MD 20814*

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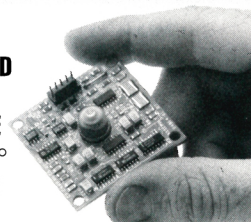
## Electric Field Plotter for the Classroom

The Electric Field Plotter from Physics Academic Software plots both the electric field lines and equipotential surfaces for an arbitrary, two-dimensional configuration of up to nine point charges. The plotter is intended as a lecture and demonstration tool and as a pedagogical aid for student investigations of electric fields. *Physics Academic Software, Campus Box 8202, North Carolina State University, Raleigh, NC 27695-8202*

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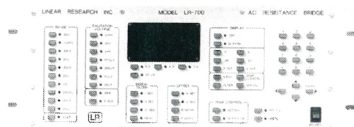
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