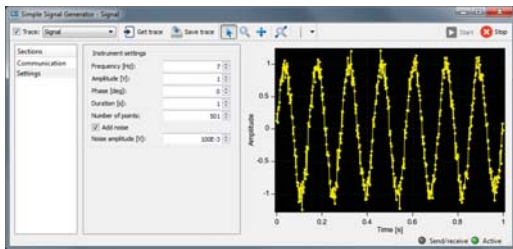


NEW PRODUCTS

Focus on test, measurement, software, and instrumentation

The descriptions of the new products listed in this section are based on information supplied to us by the manufacturers. PHYSICS TODAY can assume no responsibility for their accuracy. For more information about a particular product, visit the website at the end of the product description. For all new products submissions, please send to ptpub@aip.org.

Andreas Mandelis



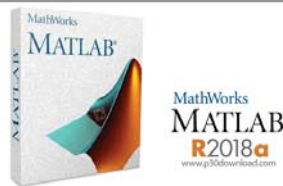
Software for experimental laboratories

Labber, a modular software platform from Lab Control Software, provides for instrument control, data acquisition, and data visualization in experimental laboratories.

With the intuitive graphical user interface, users can easily perform day-to-day experiments, and with the Python programming interface, they can run custom applications and more advanced automation scenarios. According to the company, Labber features ease of use, modularity, and expandability. For optimal organization of experimental results, Lab Control Software also offers a package for storing and visualizing scientific data. **Lab Control Software Scandinavia AB**, Sjöholmen Kattilstorp, SE-35593 Vaxjo, Sweden, www.labber.org

Mathematical programming software

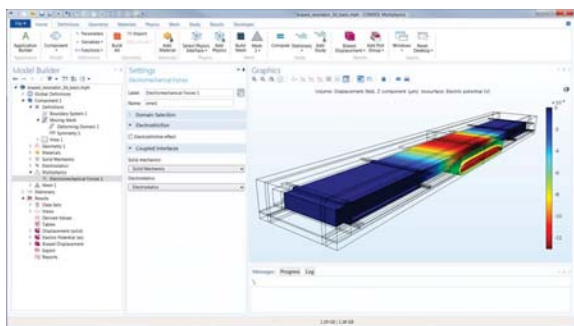
The MathWorks has released version R2018a of MATLAB and Simulink. MATLAB is a programming environment for algorithm development, data analysis, and numeric computation; Simulink is a graphical environment for simulation and model-based design for multidomain dynamic and embedded systems. Among the new products are a toolbox for designing and testing condition-monitoring and predictive-maintenance algorithms and a blockset for modeling and simulating vehicle dynamics in a virtual 3D environment. Also included are updates and bug fixes to 94 other products. For example, MATLAB has updated its Live Editor with live functions, documentation authoring, and interactive controls for embedding sliders and drop-down menus. Simulink updates include a predictive quick insert to connect a recommended block to an existing block in a model. **The MathWorks Inc**, 1 Apple Hill Dr, Natick, MA 01760-2098, www.mathworks.com



Multidevice synchronization



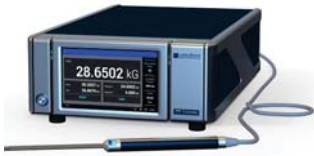
Lock-in amplifiers and arbitrary waveform generators can now be synchronized using the multidevice synchronization (MDS) function from Zurich Instruments. Multiple instruments can be connected and controlled from one user-friendly interface. MDS synchronizes both the 10 MHz clock and the sampling rate of each instrument and allows measurements to be taken simultaneously on multiple devices. Data points are labeled with corresponding time stamps, which allows for clear waveform digitization and analysis. The company's LabOne software has integrated tools for signal analysis that reduce the complexity of setups involving such instruments as sweepers, oscilloscopes, and digitizers. Existing Zurich Instruments users can add MDS functionality free of charge by updating LabOne to version 17.12. Applications include quantum computing setups, quantum transport, and synchrotron beam-position monitoring. **Zurich Instruments AG**, Technoparkstrasse 1, 8005 Zürich, Switzerland, www.zhinst.com



Modeling and simulation software

Comsol has made available the latest iteration of its Multiphysics software for modeling and simulating scientific and engineering problems. Enhancements to Comsol version 5.3a include a new method for capacitively coupled plasma simulations that reduces computation times in electromagnetics and hybrid boundary element-finite element methods for magnetic field analysis and for acoustics and acoustic-structure interactions. It also offers impulse response analysis for ray acoustics. In the area of fluid flow, all turbulence models can be applied to multiphase flow, and rotating machinery interfaces are available for all flow interfaces. Version 5.3a offers a built-in thermodynamics library for calculating physical

properties of pure fluids, mixtures, and two-phase fluid systems. **Comsol Inc**, 100 District Ave, Burlington, MA 01803, www.comsol.com



Magnetic measurement instruments

Lake Shore Cryotronics offers its F41 single-axis and F71 multi-axis teslameters, compatible FP series Hall probes, and 2Dex Hall sensors for precise, convenient measurement in challenging applications. They have TruZero technology that minimizes misalignment voltages and eliminates the need to rezero a probe. The Hall sensors feature high sensitivity and linearity over a wide field range. A small, ultrathin active area on the sensors ensures accurate field readings and all but eliminates planar Hall effect errors that can cause measurement offsets in current-generation three-axis probes. The instruments work equally well on a benchtop or in a rack. Probe swapping is simplified by a compact, quick-release connector with integrated calibration data that are used for all probes. **Lake Shore Cryotronics Inc**, 575 McCorkle Blvd, Westerville, OH 43082, www.lakeshore.com

Controllers for synchronized measurements



National Instruments has announced new CompactRIO controllers for research and industry. They feature submicrosecond synchronization with time-sensitive networking over standard Ethernet. TSN can synchronize distributed systems across networks and eliminate the need for costly synchronization cables. The company's intuitive NI-DAQmx driver software shortens time to measurement compared with previous versions of the controllers. The industrial-grade processor and onboard field-programmable gate array, which is programmable with LabVIEW, enable high-performance data analysis and control. With an operating temperature range of -40°C to 70°C , shock resistance up to 50 g, and vibration resistance up to 5 g, the controllers can operate reliably in harsh environments. **National Instruments**, 11500 N Mopac Expy, Austin, TX 78759-3504, www.ni.com

Fast-sampling digitizer cards



Spectrum Instrumentation has extended the performance range of its general-purpose M2p.59xx series of PCIe 16-bit digitizer cards by adding five models that increase the maximum sampling rate from 80 MS/s to 125 MS/s. Because they can capture a wide range of electronic signals, they are suitable for use in applications in which signals in the DC to 50 MHz frequency range need to be acquired and analyzed fast and accurately. The series includes models that provide one, two, four, or eight input channels. Multichannel models each have their own analog-to-digital converter and signal conditioning circuitry to allow fully synchronous acquisitions on all the inputs. Applications include big physics experiments, lidar, lasers, and medical science. **Spectrum Instrumentation Corp**, 15 Warren St, Ste 25, Hackensack, NJ 07601, <https://spectrum-instrumentation.com>

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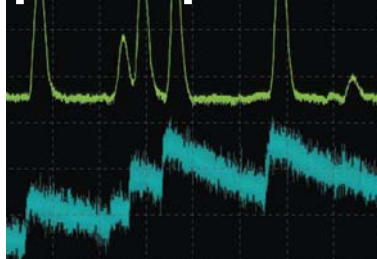
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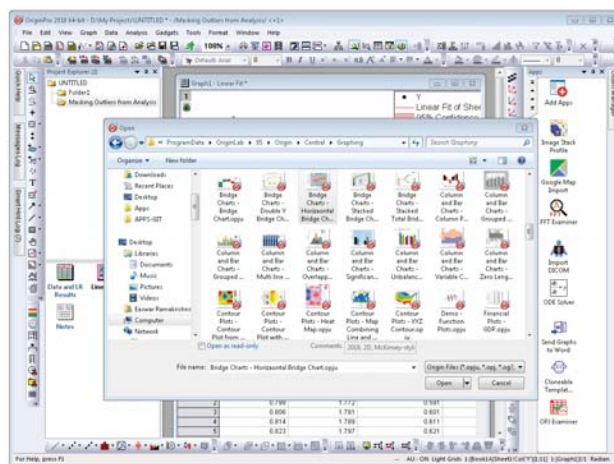
Great for amplifying pulsed optical signals or pulses from nuclear radiation detectors. Our modules are designed to be plugged into your detection instrumentation. Evaluation boards and housings are available.

product specifications and application notes at:
<http://cremat.com>
Cremat Inc. West Newton, MA USA

NEW PRODUCTS

Recirculating cryocooler

Janis's model RGC4 recirculating cryocooler eliminates the need for costly liquid helium in "wet" cryogenic probe station systems and instead delivers a stream of 4 K helium to the probe station. After cooling the sample and thermal shields, helium gas exits the probe station, is recooled by the cryocooler, and reenters the probe station at 4 K in continuous closed-loop circulation. Physically decoupling the cryocooler from the probe station reduces the vibration displacement at the sample location by more than an order of magnitude. The model RGC4 can be used with other continuous-flow cryostats, such as the Janis ST-500 microscopy cryostat. The combination provides positional stability to less than 10 nm and is suitable for microphotoluminescence, micro-Raman, and other vibration-sensitive techniques. **Janis Research Company LLC**, 225 Wildwood Ave, Woburn, MA 01801-2025, www.janis.com



Data analysis and graphing software

OriginLab has added more than 75 new features, improvements, and apps to the latest version of its data analysis and graphing software, Origin and OriginPro 2018. Ease-of-use enhancements include a new App Center dialog to

install and update apps with a single click. The Origin Central dialog has been improved, with such additions as a graph preview in Windows Explorer, plot types, and several apps. Also included are cell-level formulas that let users perform calculations and summary operations in their Origin worksheets. Unicode support allows users to easily exchange Origin files with colleagues around the world. A new project file structure significantly reduces file size. **OriginLab Corporation**, One Roundhouse Plaza, Ste 303, Northampton, MA 01060, www.originlab.com

Multiaxis positioning stage controllers

Physik Instrumente (PI) now offers modular high-performance motion controllers suitable for four, six, or eight axes for its PIglide air-bearing positioning stages. The controllers are based on hardware from ACS, a multiaxis motion controller manufacturer in the PI group, and support the ACS ServoBoost algorithm, which allows for stable servo control that is insensitive to noise and to changes in the system. The A-82x series of motion controllers integrate drivers, power adapters, and controllers in a compact, 4RU, 19-inch rack and can be customized for OEM users. Depending on the number of axes to be controlled, the units supply a continuous power of 1100–2000 W and up to 3900 W peak power. Applications for the air-bearing stages include metrology, optical-fiber alignment, and semiconductor manufacturing. **Physik Instrumente LP**, 16 Albert St, Auburn, MA 01501, www.pi-usa.us



Refractometer



Shimadzu has released its KPR-300 Kalnew precision refractometer. The high-accuracy, multiwavelength digital instrument measures the refractive indices of transparent samples, including lenses and prisms, to an accuracy of $\pm 4 \times 10^{-5}$ and a repeatability of $\pm 1 \times 10^{-5}$. It uses the V-block method, which, according to the company, provides excellent measurements in optical materials. The KPR-300 is equipped with spectral lamps and can perform automatic refractive index measurements and automatic calculations of Abbe numbers at three wavelengths. Users can measure a wide range of refractive indices by choosing among various sample holder V-block prisms. **Shimadzu Scientific Instruments Inc.**, 7102 Riverwood Dr, Columbia, MD 21046, www.ssi.shimadzu.com

Interferometric atomic displacement sensor

Oxford Instruments Asylum Research has developed an interferometric displacement sensor (IDS) that directly measures the displacement of atomic force microscope (AFM) cantilevers. The IDS interfaces the optical system of Asylum's Cypher AFM with an external laser Doppler vibrometer. It provides a complementary method of detecting true tip displacement rather than replacing the standard laser and detector. The module can be used as a secondary channel of information during regular AFM measurements, or it can replace an optical-beam deflection (OBD) channel for any dynamic imaging mode. According to Asylum, its IDS option can provide more accurate electromechanical measurements than is possible with the traditional OBD or "beam bounce" technique in piezoelectric and ferroelectric materials research. **Oxford Instruments Asylum Research Inc.**, 6310 Hollister Ave, Santa Barbara, CA 93117, www.asylumresearch.com

Optical wavelength meter

The latest optical wavelength meter from Bristol Instruments, model 828A, has a Fizeau etalon design and measures the absolute wavelength of modulated and CW optical signals to an accuracy as high as ± 0.3 pm. It delivers a sustained measurement rate up to 1 kHz, which, according to the company, is the fastest measurement rate available. The system's speed provides a time resolution as short as 1 ms and yields detailed wavelength characterization of components such as tunable wavelength-division-multiplexing lasers. Consistent system performance is maintained over long periods by calibrating the meter to a built-in wavelength standard. Operation is straightforward, and a convenient touch-screen display reports measurement data in various formats. **Bristol Instruments Inc.**, 770 Canning Pkwy, Victor, NY 14564, www.bristol-inst.com



Automated x-ray diffraction system

Rigaku has released the latest version of SmartLab, its intelligent, multipurpose x-ray diffraction system. It couples two of the company's instruments: the PhotonMax high-flux, 9 kW, rotating anode x-ray source and the HyPix-3000 high-energy-resolution 2D multidimensional semiconductor detector, which supports 0D, 1D, and 2D measurement modes. The configuration lets users manage all applications with a single detector; they do not need to prepare and switch detectors to handle different applications. The system's Cross Beam Optics family features fully automated switchable reflection and transmission optics. SmartLab accepts powders, films, and textile samples and allows mapping measurements within a sample. Real-time *in situ* measurements can be performed using Rigaku's new SmartLab Studio II software suite. **Rigaku Americas Corporation**, 9009 New Trails Dr, The Woodlands, TX 77381-5209, www.rigaku.com **PI**

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