NEW PRODUCTS

Focus on software, data acquisition, and instrumentation

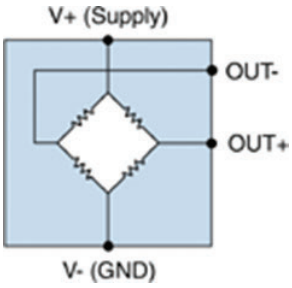
The descriptions of the new products listed in this section are based on information supplied to us by the manufacturers. PHYSICS TODAY can assume no responsibility for their accuracy. For more information about a particular product, visit the website at the end of its description. Please send all new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

Andreas Mandelis

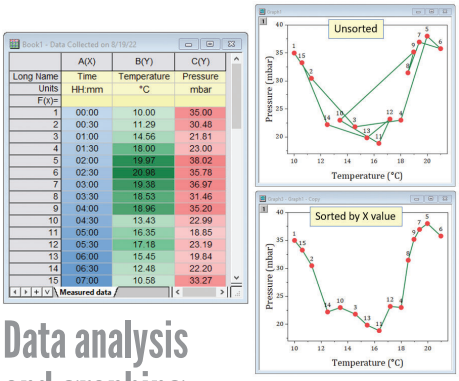
Integrated pump-motor technology

To diversify optimization choices, KNF has expanded its Digital Customization series by adding a new motor option. The DC-BI motor for diaphragm pumps offers a new ball-bearing configuration and the full integration of motor and housing. It relies on an advanced brushless DC electric motor developed in-house, and for maximum compactness and robustness, the motor, pump housing, ball bearings, and eccentric form one single unit. The newly developed housing improves the pump's heat management, especially under continuous heavy load. To extend the pump's lifetime, the size of the ball bearings has been increased and their placement optimized. Several of the company's micro gas pumps and liquid pumps can be customized with the new DC-BI motors. ***KNF Neuberger Inc**, 2 Black Forest Rd, Trenton, NJ 08691-1810, https://knf.com*

Magnetometer integrated circuit

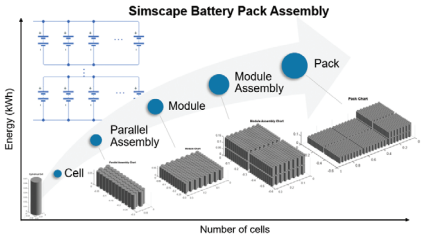


The ALT021-10E analog magnetometer from NVE has a sensitivity of 0.5 mV/V/μT, which the company claims makes it the world's most sensitive magnetometer integrated circuit. Based on NVE's ALT series tunneling-magnetoresistance technology, the new part can precisely measure fields from less than a microtesla to 250 μT. The differential bridge outputs are bipolar, meaning positive for a positive magnetic field and negative for an opposite-polarity magnetic field. The ALT021-10E features a large signal of 200 mV/V full-scale (typical), a flexible 0–14 V supply, 20 kΩ device resistance for low power, and an operating range from −40 °C to 125 °C. The ALT021-10E is suitable for various low-field sensing applications, including motion, speed, and position control; noncontact current sensing; and mechatronics and robotics. ***NVE Corporation**, 11409 Valley View Rd, Eden Prairie, MN 55344, www.nve.com*



Data analysis and graphing software

The 2022 version of Origin and OriginPro, OriginLab's data analysis and graphing software, adds more than 100 new features, improvements, and apps. Major upgrades have been made to the organization and management of an Origin project: Users can now add folder notes using rich text and preview the notes when hovering over a folder in the Project Explorer. Worksheet formatting, exporting, and viewing features have been enhanced, and new plotting features include support for plotting double-*y* graphs in a single layer. Methods have been added for smart skipping of symbols for large data sets and for performing automatic *x*-value sorting of data in line plots and line and symbol plots. An Angle Annotation tool adds a labeled arc in 2D graphs. LabTalk scripting upgrades include Script Window with syntax-coloring and Unicode support. New graph types include stacked 3D heat map and ternary vector; among new apps are Bootstrap Sampling, Pulse Fit, and Propagation of Error PRO. ***OriginLab Corporation**, One Roundhouse Plaza, Ste 303, Northampton, MA 01060, www.originlab.com*



Mathematical programming software

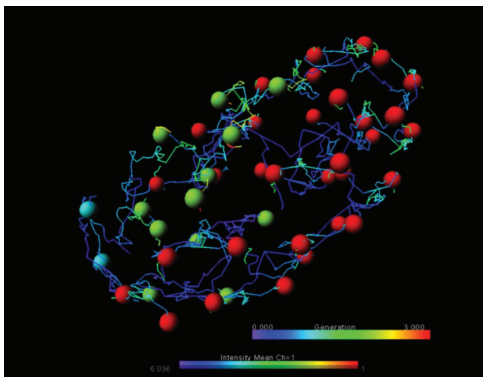
MathWorks has unveiled Release 2022b (R2022b) of its MATLAB and Simulink software. The release introduces Simscape Battery, which provides design tools and parameterized models that can be used to create digital twins, run virtual tests of battery-pack architectures, design battery management systems, and evaluate battery system behavior across normal and fault conditions. It automates creating simulation models that match desired pack topology and includes cooling-plate connections so electrical and thermal responses can be evaluated. The new Medical Imaging Toolbox provides apps, functions, and workflows for designing and testing diagnostic imaging applications, while the Deep Learning Toolbox lets users train predefined deep-learning networks on medical images. R2022b updates widely used MATLAB and Simulink tools such as AUTOSAR (Automotive Open System Architecture) Blockset; HDL (hardware description language) Coder; and the Fuzzy Logic, Model Predictive Control, and System Identification Toolboxes. ***The MathWorks Inc**, 1 Apple Hill Dr, Natick, MA 01760-2098, www.mathworks.com*

PCIe validation testing

According to Tektronix, its new TMT4 Margin Tester breaks new ground as a faster, easier approach to PCIe (peripheral-component-interconnect express) testing. The specialized tool for design and validation of PCIe Gen 3 and Gen 4 motherboards, add-in cards, and system development processes complements compliance testing systems that consist of oscilloscopes and bit-error-rate tests. It can uncover issues earlier in the design process before using traditional equipment to do an in-depth examination. The TMT4 tester's plug-and-play setup and easy-to-use interface deliver in minutes results that, up until now, required hours or days. Multilane testing capabilities significantly improve overall performance times by reducing the number of connection changes needed. Users at all levels of expertise can test PCIe devices across up to 160 combinations of lanes and presets in as little as 20 minutes at Gen 4 speeds. ***Tektronix Inc**, 14150 SW Karl Braun Dr, PO Box 500, Beaverton, OR 97077, www.tek.com*

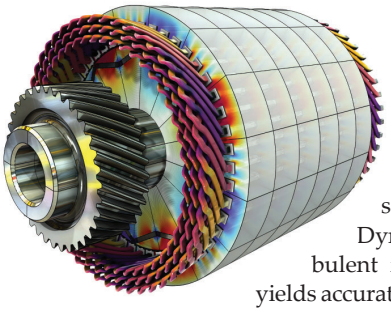
Software-defined test instrumentation

Liquid Instruments has upgraded its Moku:Pro and Moku:Go hardware platforms. Release 2.5 brings new capabilities that increase the functionality of the phasemeter, lock-in amplifier, frequency-response analyzer, and the company's Laser Lock Box to address more use cases in applications such as microscopy, spectroscopy, and quantum computing. With expanded application-programming-interface support for Multi-instrument Mode and Moku Cloud Compile, users can programmatically query and control advanced measurement configurations using Python, MATLAB, and LabVIEW. Those working on automated test systems can deploy and configure multiple instruments to a single device and perform tests with Multi-instrument Mode programmatically. Using Moku Cloud Compile, they can control custom digital-signal-processing blocks in an automated test environment. Moku:Go's lock-in amplifier can now be used in Multi-instrument Mode. ***Liquid Instruments**, 740 Lomas Santa Fe Dr, Ste 102, Solana Beach, CA 92075, www.liquidinstruments.com*



Software for microscopy image analysis

The latest release of Oxford Instruments' Imaris software for microscopy image analysis improves the speed of calculation and visualization of detected models. The filament tracer in the 10.0 version combines the versatility of an AutoPath intensity-based method with a machine-learning approach. According to the company, it provides the most flexible tool available for tracing a multitude of neuron types and can resolve within minutes various structures, such as neurons, dendritic spines, microglia, and blood vessels. Creating filament models is easy, even for inexperienced users, because they are guided via precisely designed wizards, with the result previewed after each step. Imaris 10.0 enables automated distance measurements between filamentous structures and other stained objects. It has been measured to be faster than its predecessor by a factor of five and easily handles much bigger data sets. ***Oxford Instruments plc**, Tubney Woods, Abingdon OX13 5QX, UK, https://nmr.oxinst.com*

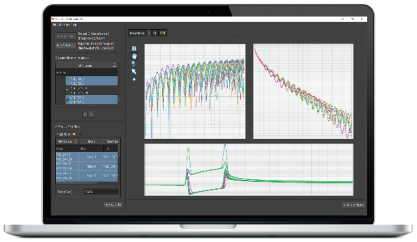


Modeling and simulation software

Comsol has launched version 6.1 of its Multiphysics software for creating physics-based models and simulation applications. The new release upgrades the fluid flow and mechanical simulation products. The Computational Fluid Dynamics Module now includes high-fidelity turbulent flow with detached eddy simulation, which yields accurate large eddy simulation with less computational effort. A new, fast method for mechanical contact is included in the Structural Mechanics and MEMS Modules. The Acoustics Module simulation environment is completed by functionality for analyzing the electrovibroacoustics of microtransducers and microacoustic systems. Additional tools for thermoviscous acoustics expand the software's capabilities for modeling speakers and microphones in consumer electronics. For users working on vehicle electrification, Comsol added to the Battery Design Module, including support for setting up thermal-runaway propagation models. In the AC/DC Module, new functionality for the rapid layout of motor windings and magnet arrays ensures a smooth workflow for electric motor design and analysis. ***Comsol Inc**, 100 District Ave, Burlington, MA 01803, www.comsol.com*

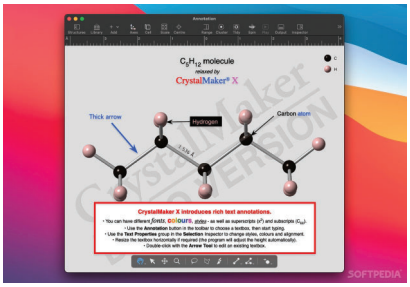
Signal-integrity simulation software

Keysight created its Electrical Performance Scan (EP-Scan) high-speed digital simulation tool to support rapid signal-integrity (SI) analysis for hardware engineers and designers of printed circuit boards (PCBs). EP-Scan performs electromagnetic simulation on signal nets and reports SI metrics such as channel return and insertion loss. It automates performance comparisons between different versions of a design and generates simulation reports that expedite verification prior to building costly physical prototypes. The only inputs EP-Scan requires are the layout geometry and substrate stack-up information for the PCB design. After users specify the desired nets for investigation, EP-Scan reports simulation results. Those include the characteristic impedance and delay of traces, return loss, insertion loss, and impedance time-domain reflectometry. By analyzing common fabrication formats such as ODB++, EP-Scan predicts how a design will perform before it's fabricated. ***Keysight Technologies Inc**, 1400 Fountaingrove Pkwy, Santa Rosa, CA 95403-1738, www.keysight.com*



Triode high-voltage power supply for thermionic SEM

Spellman High Voltage has added to its portfolio of triode high-voltage power supplies designed to drive thermionic scanning electron microscopes (SEMs). The EBM-TEGR offers digital communication, a rack-mountable 19-inch chassis, and higher output power on the accelerator and grid outputs. According to the company, its proprietary packaging and encapsulation technology deliver improvements in size, cost, and performance compared with other SEM power-supply offerings. The EBM-TEGR provides a high-precision, low-noise, ultrastable accelerator supply programmable up to −30 kV at 400 μA. This supply, together with floating filament and grid supplies using the accelerator as a reference, controls the beam. To drive the detector, which comprises photomultiplier-tube, scintillator, and collector-grounded outputs, the unit uses high-voltage outputs. The units are protected from overcurrent and overvoltage, arcs, and short circuits. OEM customizations are available. ***Spellman High Voltage Electronics Corp**, 475 Wireless Blvd, Hauppauge, NY 11788, www.spellmanhv.com*



Crystal-structure software

CrystalMaker has updated its software for visualizing crystal and molecular structures in research and teaching in chemistry, solid-state physics, materials science, mineralogy, and crystallography. Version 10.8 offers new functionality and enhanced ease of use. Smart autorotation lets users define rotation axes relative to their structure rather than the screen, which means they can manually rotate a structure spinning about a specific unit cell direction, zone axis, or chemical bond. A redesigned bend-selection interface allows users to enter a radial offset between the start and end of a "bend" and thereby define a nanoscale spiral instead of a nanotube. New commands have been added to view the structure parallel to, or perpendicular to, an existing selection: atoms, bonds, or a general selection. Other changes include calculation of the mean distance from a plane, faster "speedy sync," more responsive popover display, and revised three-body potentials. ***CrystalMaker Software Ltd**, Centre for Innovation & Enterprise, Oxford University Begbroke Science Park, Woodstock Rd, Begbroke, Oxfordshire, OX5 1PF, UK, www.crystalmaker.com*

Phase-noise analyzers

Rohde & Schwarz has improved its R&S FSPN dedicated phase-noise analyzer and voltage-controlled-oscillator (VCO) tester and its high-end R&S FSWP instrument that combines phase-noise analysis, VCO testing, and signal and spectrum analysis. Each instrument's performance is now faster and more accurate, and the sensitivity of each is enhanced by new hardware that includes upgraded DC sources with reduced noise levels. The capacitive screen features higher color intensity and better anti-glare properties, and the updated user interface supports multitouch features such as zoom. For very low-noise oscillators whose inherent noise is largely thermal at wider offsets, any potential cross-spectral collapse is now suppressed. Uniquely for this class of instrument, according to the company, both analyzers include test-sequence recording functions. With the newly introduced SCPI (Standard Commands for Programmable Instruments) command recorder, Rohde & Schwarz implements a function with phase-noise measurement equipment to record sequences of manual settings. It can be used to create easily repeatable test sequences, including synchronization. ***Rohde & Schwarz GmbH & Co KG**, Mühldorfstraße 15, 81671 Munich, Germany, www.rohde-schwarz.com* PT