New Products

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. To facilitate inquiries about a particular product, a Reader Service Card is attached inside the back cover of the magazine.

Lawrence G. Rubin

Focus on Magnetics

NMR Probe and Accessory

The AutoX Probe from Varian is a dual broadband, pulsed-field-gradient probe optimized for automated NMR systems. The new probe features innovative circuit elements that allow for continuous tuning of both probe channels over their specified frequency range. When used in conjunction with the company's ProTune accessory, tune-and-match procedures can be optimized on either or both the low-frequency (from nitrogen to phosphorus) or the high-frequency (from hydrogen to fluorine) probe channels. ProTune offers a simple, automated solution to the time-consuming requirement to manually tune probes with changing solvents, sample temperature, or nuclei. It also supports remote control of a probe's tune-and-match adjustments. ProTune includes platform-specific software running as part of the company's standard NMR software package VnmrJ. *Varian Inc, 3120 Hansen Way, D-300, Palo Alto, CA 94304-1030, http://www.varianinc.com*

Circle number 131 on Reader Service Card

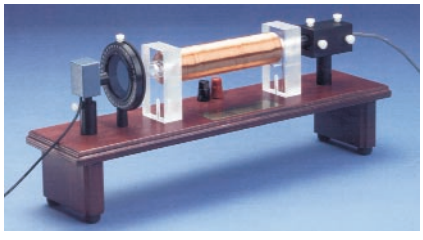
GMR Signal Coupler

NVE has developed a dual passive-input digital isolator based on NVE's IsoLoop giant magnetoresistance sensor technology. In each channel of the IL611 device, a current-fed coil input is vertically isolated from a GMR Wheatstone bridge by a polymer dielectric layer. The bridge outputs are connected to a comparator, which in turn feeds a CMOS output stage or an open-drain transistor output (IL611A). An advantage of the passive coil input is that both single-ended and differential inputs can be handled without the need for reverse bias protection. Also, both inverting and noninverting operations are simple to configure. The 1L611 coupler, like the standard diode-input optocoupler, can be used in the same general applications, but with fewer limitations on bandwidth, current consumption, temperature range, and wear-out time. *NVE Corporation, 11409 Valley View Road, Eden Prairie, MN 55344-3617, http:// www.nve.com*

Circle number 132 0n Reader Service Card

Faraday Rotation Apparatus

TeachSpin has introduced the FR1-A Faraday rotation apparatus, a hands-on classroom instrument for demonstrating the interaction of light, matter, and magnetic fields. The system (see photo) includes a light source, a rotatable Polaroid film in a calibrated mount marked in 5° increments, and a photodiode optical detector. There is a 10-cm-long SF-59 glass rod sample in which the light's plane of polarization is rotated by the field in the solenoid. The light source is a red laser pointer operating at a wavelength of approximately 650 nm and is directed through



a polarizing filter that increases the polarization to about 95%. The solenoid is a 15-cm coil producing a magnetic field of about 11 mT/A; the maximum continuous current through the coil is 3 A. Crossed polarizers are mounted on each end of the sample. *TeachSpin Inc, Tri-Main Center, Suite 409, 2495 Main Street, Buffalo, NY 14214-2153, http://www.teachspin.com*

Circle number 133 on Reader Service Card

Hall-Effect Sensors

Allegro Microsystems has announced a family of linear Hall-effect sensors rated for operation to 150°C. Each BiCMOS monolithic circuit integrates a Hall element; improved temperature-compensating circuitry; a small-signal, high-gain amplifier; and a rail-to-rail low-impedance output stage. A dynamic offset cancellation technique with an internal high-frequency clock reduces the residual offset voltage and produces devices that have a very stable quiescent output voltage, are immune to mechanical stress, and have precise recoverability after temperature cycling. Having the Hall element and an amplifier on a single chip minimizes many problems associated with low-level analog signals. Output sensitivity options include 2.5, 3.125, and 5 mV/G. *Allegro Microsystems Inc, 115 Northeast Cutoff, Worcester, MA 01606, http://www.allegromicro.com*

Circle number 134 on Reader Service Card

Ferrites for High-Frequency Operation

ACME Magnetics USA has expanded its line of manganese-zinc ferrite materials with the addition of P51 material for high-frequency-power electronics applications. Compared with the company's P5 material, the new P51 offers a 50% reduction in core loss at elevated temperatures and a 20% increase in saturation flux density. Flux density is from 400 mT at 100°C to 490 mT at 25°C; initial permeability is 1500 ±25% at 10 kHz. Suitable for DC/DC converters, high-frequency transformers, and switch-mode power supplies, this magnetically soft material achieves higher output in smaller sizes over previous versions and features working frequencies up to 1 MHz. The company offers its P51 material in a range of standard and custom shapes, including low-profile geometries. *ACME Magnetics USA Inc, 2475 Coral Street, Suite A, Vista, CA 92081, http://www.acmemagusa.com*

Circle number 135 on Reader Service Card

Active-Shielded NMR Magnet

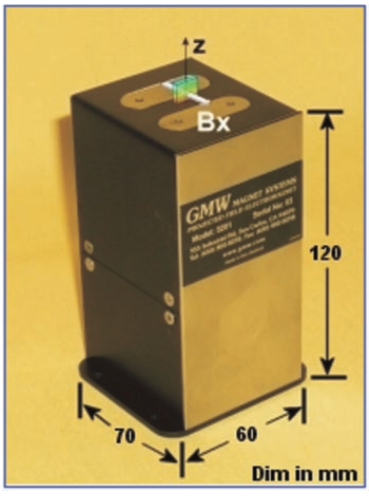
The 700/89 Ultrashield Plus wide-bore NMR magnet from Bruker BioSpin incorporates the company's active-shielding technology to significantly reduce stray fields and screen external field perturbations. The 5-G enclosed volume is an order of magnitude smaller than the first-generation UltraShield and its 5-G footprint is four times less. The magnet's compact design enables the new wide-bore (89 mm) version to fit in the same-size cryostat as Bruker's 54-mm, standard-bore, 700-Mhz NMR magnet. This physical design, combined with the low stray field,

allows the new 700/89 to be sited in standard, single-story laboratories. Until now, reportedly the highest field-strength, wide-bore magnet that would fit into a single-story lab was 600 MHz. Wide-bore UltraShield Plus magnets are available at 400–700 MHz. *Bruker BioSpin Corporation, 15 Fortune Drive, Manning Park, Billerica, MA 01821-3991, http:// www.bruker-biospin.com*

Circle number 136 on Reader Service Card

External Field Electromagnet

GMW Associates has developed the model 5201 Projected Field Electromagnet for applications that require a



variable magnetic field component in the plane of, for example, a thin magnetic film with open access to one face of the film for electrical scanning or optical probes. At a distance of $z = 2$ mm (perpendicular to the electromagnet surface), a field B_x (parallel to the surface) can be computer- or manually controlled over the range ±4 kG; B_x decreases to ±1 kG at $z = 12$ mm. The B_x component is uniform to ±1% in a planar, thin volume of $2 \times 10 \times 0.2$ mm (x, y, z). Small size and low weight (less than 2.1 kg) enable the 5201 to be mounted in any orientation on standard transverse and rotary motion stages for control of the field in position and angle with respect to the sample. The projected field can be introduced into a vacuum chamber or cryostat. *GMW Associates, 955 Industrial Road, San Carlos, CA 94070, http://www.gmw.com*

Circle number 137 on Reader Service Card

Magnetic Simulation Software

Magsoft is releasing Flux Version 9, part of the company's Flux tools—finite-element, method-based, computer-aided-engineering software packages for the analysis and design of electromagnetic and electromechanical devices, applications, and processes. The new version features PC-based functionality in a common interface for the company's Flux2D and Flux3D products. Continued overall improvements in the interface have allowed this new version to provide capabilities such as parameter controls for geometry shape, location, and position, for mesh distribution, physical properties, electrical inputs; external circuit and drive connection for all types of conductors; mechanical component coupling; a transient solver that includes motion-induced eddy currents; and solid-body motion coupling for linear and rotational displacements. *Magsoft Corporation, 1223 Peoples Avenue, Troy, NY 12180, http:// www.magsoft-flux.com*

Circle number 138 on Reader Service Card

Probe Station With Magnet

Desert Cryogenics, a division of Lake Shore Cryotronics, has introduced four-arm probe stations equipped with a 1-T horizontal-field, integrated split-pair superconducting magnet. The new configuration complements the company's previously released vertical-field version. The horizontal field is generated along the axis of two of the probes. Field homogeneity is maintained around the sample area within ±1% over a 10-mm diameter spherical volume. The new system allows the sample temperature to vary from 4.2 to 80 K while maintaining the magnet in its superconducting state. An optional 3-K version is available. Probe manipulation is performed using Desert Cryogenics's zero-backlash x-y-z stages. *Lake Shore Cryotronics Inc, 575 McCorkle Boulevard, Westerville, OH 43082, http://www.lakeshore.com*

Circle number 139 on Reader Service Card

Nanopositioning System

The microTRITOR from piezosystem jena is a piezo-based positioning system that provides a total range of motion up to 9 μm in the x-, y-, and z-axes. The outside dimensions for the system, $15 \times 15 \times 15$ mm, reportedly make it the world's smallest x-y-z nanopositioning device. This size allows easy integration into scanning applications in the fields of semiconductor, surface technology, materials science, and metrology. With a resonant frequency of nearly 2.3 kHz, the microTRITOR features an open-loop resolution of 0.02 nm. It offers a monolithic guidance design of solid flexure hinges that enable it to be free of mechanical play and friction. Vacuum and cryogenic versions are available. The recommended controller unit is the company's NV 40/3S complete system or the PC-3 channel controller card. *piezosystem jena Inc, 54 Hopedale Street, Hopedale, MA 01747, http:// www.piezojena.com*

Circle number 140 on Reader Service Card

Ethernet-Based Motion Control

Newport's XPS integrated motion controller/driver offers a high-speed communication link through 10/100 Base-T Ethernet with TCP/IP protocol. The XPS is ideal for demanding multiaxis motion applications that require 10-kHz servo and also data acquisition rates; multiple I/O functionality with less than 50 ns latency; and true, real-time multitasking capabilities. Universal driver modules allow the XPS to drive one to eight axes of stepper, DC servo, DC brushless, voice coil, or piezoelectric actuation. Advanced trajectory modes include multiaxis PVT (position-velocity-time) and spline; analog tracking; and traditional jogging, point-to-point and line-arc motions. All operational modes are accessed through the XPS's Web-based facilities. *Newport Corporation, 1791 Deere Avenue, Irvine, CA 92606, http://www.newport.com*

Circle number 141 on Reader Service Card

New Literature

Magnetic Shield publishes the quarterly newsletter, *Magnetic Shield Update*, which contains engineering notes, case studies, and general articles about magnetic shielding. The publication is available in printed and electronic formats. *Magnetic Shield Corporation, Perfection Mica Co, 740 North Thomas Drive, Bensenville, IL 60106, http:// www.magnetic-shield.com*

Circle number 142 on reader Service Card

A mass spectrometry newsletter, *Mass Media*, is published semiannually by JEOL-USA. New developments in the field are discussed and brief summaries of new application notes are included along with a reference to a complete copy of the notes. *JEOL-USA Inc, 11 Dearborn Road, Peabody, MA 01960, http://www.jeol.com* ■

Circle number 143 on Reader Service Card