

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. For more information about a particular product, visit the website at the end of the product description.

Andreas Mandelis

Focus on vacuum and cryogenics

Cryocooler interface

ColdEdge has introduced cryocooler interfaces capable of reading temperatures up to 1000 K and down to cryogenic levels. They allow for testing over a wide temperature range without the need to disturb a sample by moving it to another heating source. Designed with robust mounts on the cold tip of the cooler, the new devices are resistant to damage during typical sample change activities. Many standard mount configurations are available, as is customization to fit a user's cold-tip or sample holder mount. The interfaces can also be used with many different closed- and open-cycle cryocoolers and with high-temperature instrumentation and temperature controllers. *ColdEdge Technologies, 905 Harrison Street, Suite 134, Allentown, PA 18103, <http://www.coldedgetech.com>*

Cryogenic temperature monitor

The new model 18C from Cryogenic Control Systems is a compact, flexible, eight-channel cryogenic temperature monitor. According to the company, virtually any cryogenic temperature sensor from any manufacturer can be selected by a single setting of the front panel, and custom or specially calibrated sensors require only a simple setup procedure. Features include Ethernet connectivity, Power over Ethernet technology, internal data logging, a large and easy-to-read display, and extensive applications software. Eight multipurpose input channels support diode sensors, platinum resistance temperature detectors, and most cryogenic negative-temperature-coefficient tem-

perature sensors. Thermocouple inputs are optional. The system operates from 250 mK to more than 1500 K with an appropriate sensor. Constant-voltage, AC excitation of resistive sensors minimizes errors and extends their useful temperature range. *Cryogenic Control Systems Inc, P. O. Box 7012, Rancho Santa Fe, CA 92067-7012, <http://www.cryocon.com>*

Hybrid low-temperature cryostat

Janis Research has introduced a new hybrid low-temperature system. With the model 2K-VTI, the company has combined a variable temperature, cryogen-free, or "dry," system with a "wet" (liquid helium-cooled) 9T/4T vector magnet to provide low-temperature and high magnetic field measurements. The 2K-VTI can be integrated with either wet or dry magnets and can be configured for samples in vacuum, ultrahigh vacuum, exchange gas, or even liquid. Because the VTI can be easily removed from the magnet, different magnets and sample cooling inserts can be combined in a variety of configurations. The model 2K-VTI system is cooled by a pulse-tube cryocooler that includes a remote motor for reduced vibration levels. The cryostat has a vacuum-insulated tail that is inserted into the cold bore of the superconducting magnet. Although the hybrid system uses a liquid helium-cooled magnet, the same 2K-VTI cryostat can alternatively be combined with a cryogen-free, room-temperature bore magnet. *Janis Research Company LLC, 2 Jewel Drive, Wilmington, MA 01887-3350, <http://www.janis.com>*

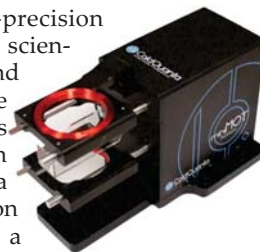
Nitrogen jet

Cryojet5, the new nitrogen jet from Oxford Instruments, features fast cooldown, one-touch cooldown and shutdown, and a wide temperature range of 85–500 K for broad experimental options. The design is compact, with no pumps or compressors, so operation is silent. There is no nozzle icing or blocking, and dual nitrogen flow technology ensures sample integrity. The jet has a five-day run time; the system can also be run continuously with the autofill option. Adjustable flow rates allow users to adapt the nitrogen jet to individual laboratory environments. Cool-down to 100 K is achieved at the push of a button in less than 5 min. Ethernet, USB, or RS-232 interfaces and integrated software packages allow for easy

remote control. Cryojet5 can be integrated with commercially available diffractometers. *Oxford Instruments plc, Tubney Woods, Abingdon, Oxfordshire, OX13 5QX, UK, <http://www.oxinst.com>*

Magneto-optical trap

In cooperation with ColdQuanta, Topica Photonics now offers a magneto-optical trap kit. The MOT, a laser cooling and trapping setup, uses a vacuum system with optical access and a magnetic quadrupole field to trap the atoms. Narrow-linewidth, frequency-stabilized Topica lasers—TA pro, DL pro, and DL distributed feedback—with spectroscopy modules and locking electronics produce an effective atomic cloud of cooled, trapped, neutral atoms. The low-density, slow-moving atoms can provide quantum information for high-precision measurements, scientific research, and education. The new miniMOT is a small vacuum system with a glass cell, an ion pump, and a rubidium dispenser.



It features optical access, a welded vacuum chamber assembly, integrated electronics, and hardware for mounting vertical optics. It has a compact footprint measuring 8.5 × 4.5 × 5.125 inches (216 × 114 × 130 mm). *Topica Photonics Inc, 1286 Blossom Drive, Victor, NY 14564, <http://www.topica.com>*

Continuous vacuum monitoring system

Pfeiffer Vacuum has developed a condition monitoring system (CMS) for vacuum pumps and gauges. Monitoring operating conditions is especially advisable for systems that incorporate a large number of pumps or pumps that are difficult to access. In special applications, data transfer can be accomplished with fiber optics in order to bridge, for example, high voltages. The CMS can be employed with all products from the company's portfolio that have the Pfeiffer Vacuum or the Adixen protocol available via an RS-485 interface. The data can be transferred over a company's Ethernet, over the internet, or wirelessly. Should the limits defined by the setup be exceeded, the change in operating condition is signaled graphically from green to yellow to red, in ac-

cordance with the traffic light principle. That is a simple way to implement monitoring for multiple systems and thereby various pumping station combinations. *Pfeiffer Vacuum Inc, 24 Trafalgar Square, Nashua, NH 03063-1988, <http://www.pfeiffer-vacuum.com>*

Positioner for small vacuum chambers

Physik Instrumente has released a new miniature hexapod for vacuum applications; a nonvacuum version is also available. The M-811.STV measures only 130 mm in diameter and 115 mm high, but it provides precision motion in all six degrees of freedom. Because of its small size, the hexapod is easily integrated into vacuum chambers. Its versatility and ease of use—users can randomly set the center of rotation by means of a simple software command—facilitate operations in vacuum. It has a high load capacity of 5 kg and speed to 10 mm/s. It features high precision; actuator resolution is 0.04 μm and repeatability is $\pm 0.5 \mu\text{m}$. Travel for XYZ is 35, 35, and 13 mm, and XYZ rotations are 20°, 20°, and 40°, respectively. All positions are conveniently given in Cartesian coordinates. *Physik Instrumente LP, 16 Albert Street, Auburn, MA 01501, <http://www.pi-usa.us>*

Simultaneous-application vacuum system

The BrandTech Vacuubrand PC620 NT integrated vacuum system provides independent electronic control of two vacuum applications simultaneously. Numerous combinations—for example, two rotary evaporators, or a rotary evaporator and a centrifugal concentrator—can be run. Integrated check valves protect each application's independent vacuum level settings and virtually eliminate the potential for cross-contamination. Vacuum is provided



by the MD4C NT diaphragm vacuum pump, which has a flow path consisting of chemically resistant fluoropolymers. An ultimate vacuum of 1.5 mbar is deep enough to evaporate most common solvents at room temperature; free air capacity is 63 l/min. A high flow rate at working vacuum level

provides the power required for most large laboratory applications. Two independent CVC3000 vacuum controllers with integrated vent valves allow for programming of set points or storing of up to 10 complex pumping programs. *BrandTech Scientific Inc, 11 Bokum Road, Essex, CT 06426-1506, <http://www.brandtech.com>*

Compact turbo pumping station

Edwards has launched a new entry-level turbo pumping station designed to provide users in laboratories and research centers with fast pump-down to an ultimate pressure of less than 5×10^{-8} mbar. The compact T-station 75 turbo cart offers reliable performance and is a plug-and-play solution for achieving high vacuum quickly and simply. The turbo cart measures only 395 $\times$ 350 mm and starts and stops by means of a single button system. It arrives preassembled and is easy to install. Each T-station incorporates the Edwards EXT75DX turbo pump with a dry XDD1 diaphragm pump (model 75D) or an E2M1.5 oil-sealed backing pump (model 75W) and a controller to yield a nitrogen pumping speed of up to 61 l/s. The EXT75DX compound turbo pumps feature reliable oil-lubricated ceramic mechanical lower bearings and a dry permanent magnetic upper bearing to provide hydrocarbon- and vibration-free ultrahigh vacuum. *Edwards, 1 Highwood Drive, Suite 101, Tewksbury, MA 01876, <http://www.edwardsvacuum.com>*

Degas vacuum chamber

A compact degas vessel and vacuum foreline trap combination for the degassing and deaeration of epoxies, gels, resins, slurries, and urethanes is available from MV Products, a division of Mass-Vac. The MV portable degassing chamber features stainless steel construction. It has a 1.5-inch-thick clear acrylic top to view contents and a Visi-Trap foreline trap to protect vacuum pumps from harmful vapors. Suitable for use in laboratories and in small batch processing operations, the bench-top degas vessel includes a 0- to 30-inch Hg gauge and vent and isolation valves. The chamber connects directly to a vacuum pump and is supplied with perforated shelves. It is offered in 15- and 4-gallon sizes. Options include trays, drains, rotary motion feed thrust for stirring contents, and various styles of ports and fittings.

Applications include removing air and trapped gases from virtually any liquid, gel, or slurry. *Mass-Vac Inc, 247 Range-way Road, P. O. Box 359, North Billerica, MA 01862-0359, <http://massvac.com>*

Cryogenically cooled CCD cameras

Princeton Instruments has designed the PyLoN series of controllerless, cryogenically cooled CCD cameras for quantitative spectroscopy applications that demand high sensitivity. The first commercially available models in the new series are the PyLoN:100 and PyLoN:400 dual-amplifier cameras that use 1340 $\times$ 100 and 1340 $\times$ 400 sensors, respectively. In creating the new PyLoN platform, Princeton Instruments redesigned its Spec-10 family of cameras and removed the external controller, thus increasing experimental flexibility while further improving the ultra-low-noise electronics. Liquid nitrogen cooling virtually eliminates dark current, and indium metal seals enhance vacuum longevity. The CCDs used in the PyLoN:100 and PyLoN:400 cameras each feature 20 $\times$ 20 μm pixels, which offers users both high resolution and wide dynamic range. *Princeton Instruments, 3660 Quakerbridge Road, Trenton, NJ 08619, <http://www.princetoninstruments.com>*

Extended temperature range encoder

With solid stainless steel scales and high vibration resistance, Renishaw's Resolute extended temperature range (ETR) encoder has been designed to bring fine pitch angle encoding to harsh, low-temperature applications. With operation guaranteed down to -40°C (-40°F) in noncondensing environments, the ETR is suitable for use in applications ranging from military and aerospace to astronomy and scientific research. The new encoder has a modular, noncontact format with zero friction between the readhead and ring. That arrangement provides wide dynamic performance and repeatability. Reliability of position data is also ensured by the ETR's immunity to dirt and built-in separate position-checking algorithm that actively monitors every reading so any potential problem is flagged before it reaches the controller. *Renishaw Inc, 5277 Trillium Boulevard, Hoffman Estates, IL 60192, <http://www.renishaw.com>* ■