

new products

Focus on vacuum and cryogenics

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

Closed-cycle refrigerator cryostat

The Janis 1.5-K closed-cycle refrigerator cryostat offers continuous operation in the temperature range of approximately 1.5–300 K (500 K optional) with a sample in either vacuum or exchange gas. Exchange gas cooling is suitable for nonconductive or irregularly shaped samples that are not easy to thermally anchor to a cold finger—for example, powders and liquid solutions. The system offers rapid sample exchange while the refrigerator is operating. Via a long rod, the sample is inserted into a nearly isothermal region of the gas column for cooling. The rod is removed, the samples are switched, and the rod is reinserted into the cryostat. The sequence takes approximately 80 minutes. Users can cool samples, devices, or equipment without the inconvenience and expense of liquid helium. Applications in academic research and industrial

R&D include materials studies, superconductivity, and neutron scattering. *Janis Research Company LLC, 225 Wildwood Avenue, Woburn, MA 01801-2025, <http://www.janis.com>*

STM-integrated cryostat

Advanced Research Systems has developed an ultralow vibration, closed-cycle cryostat for integration with cryogenic scanning tunneling microscopes. The CS202PF-ULV-STM allows atomic-resolution-level scanning tunneling microscopy (STM) on highly ordered pyrolytic graphite at temperatures below 15 K. The increasing cost of liquid helium has been a limiting factor in low-temperature STM research, and the vibrations associated with standard closed-cycle cryostats were too high for atomic resolution. However, the new ultralow vibration interface allows for a reduction in vibration levels. The cryostat permits long-duration cryogenic STM imaging without relying on the availability and use of liquid helium. *Advanced Research Systems Inc, 7476 Industrial Park Way, Macungie, PA 18062, <http://www.arscryo.com>*

Benchtop digital spectrometer

The Ortec Products Group of Ametek now offers the Alpha Mega, a digital alpha spectrometer for environmental laboratories and counting room applications that require large sample size analysis. The device can accommodate filter samples up to 106 mm in diameter, which are often used in ambient air sampling and would be particularly useful for emergency response in the event of an airborne release; having a larger chamber to match the size of the filters saves time. The Alpha Mega easily integrates into the Alpha Ensemble modular system, which can be configured with up to four modules in any combination of Alpha Mega (single-chamber) or Alpha Duo (dual-chamber)



spectrometers. All AlphaSuite spectrometers require vacuum, power, and a connection to a PC. The preamplifier, high voltage supply, and calibration pulse are computer controlled. *Ortec Products Group, 801 South Illinois Avenue, Oak Ridge, TN 37831-0895, <http://www.ortec-online.com>*

Nanopositioners for vacuum environments

The new ANPx321/HL and ANPx341/HL nanopositioner series from attocube are designed for moving high loads both horizontally and vertically over a long travel range. According to the company, the nanopositioners are stable, are robust, and enable flexible and versatile setups in many application areas. While all-bearing-based positioners allow for the movement of high loads far beyond 100 N in the horizontal direction, the maximum load in the vertical orientation has thus far only reached 2 N in ambient conditions and 0.5 N for vacuum applications. However, the company specifies a liftable load of up to 5 N not only for ambient environments but also for the more demanding vacuum ones in the vertical direction while still offering the full travel range of up to 20 mm. *Attocube systems AG, Königinstrasse 11a, 80539 Munich, Germany, <http://www.attocube.com>*

Mass spectrometers for UHV/XHV studies

Hidden Analytical has introduced a family of quadrupole mass spectrometers for ultrahigh and extreme high vacuum use. They incorporate triple-stage mass filter technology for optimum mass separation, ion transmission efficiency, and contamination resistance. For high sensitivity and fast response times, the series includes a choice of positive ion only or combined positive and negative pulse ion counting detection. Detection



APS CONGRESSIONAL SCIENCE FELLOWSHIP 2014-2015

THE AMERICAN PHYSICAL SOCIETY is currently accepting applications for the Congressional Science Fellowship Program. Fellows serve one year on the staff of a senator, representative or congressional committee. They are afforded an opportunity to learn the legislative process and explore science policy issues from the lawmakers' perspective. In turn, Fellows have the opportunity to lend scientific and technical expertise to public policy issues.

QUALIFICATIONS include a PhD or equivalent in physics or a closely related field, a strong interest in science and technology policy and, ideally, some experience in applying scientific knowledge toward the solution of societal problems. Fellows are required to be members of the APS.

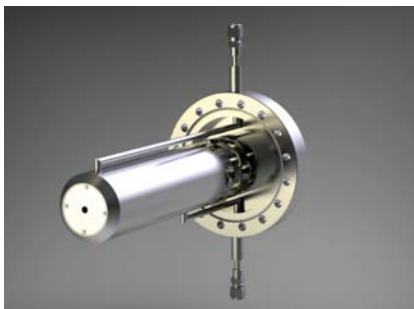
TERM OF APPOINTMENT is one year, beginning in September of 2014 with participation in a two week orientation sponsored by AAAS. Fellows have considerable choice in congressional assignments.

A STIPEND is offered in addition to allowances for relocation, in-service travel, and health insurance premiums.

APPLICATION should consist of a letter of intent of no more than 2-pages, a 2-page resume: with one additional page for publications, and three letters of reference. Please see the APS website (<http://www.aps.org/policy/fellowships/congressional.cfm>) for detailed information on materials required for applying and other information on the program.

**ALL APPLICATION
MATERIALS MUST BE
SUBMITTED ONLINE BY
CLOSE OF BUSINESS
ON JANUARY 15, 2014
(5:00 PM EST).**

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is achieved by fast pulse counting with continuous seven-decade scaling from 1 c/s to 10^7 c/s. Quadrupole mean energy scanning is available on systems configured for analysis of externally generated ions, enabling ion energy distribution measurement and optimization for neutrals analysis. All systems have the Windows-MASoft Pro multimode control program with multi-parameter scanning to optimize parameters for each individual mass channel. *Hidden Analytical Inc, 37699 Schoolcraft Road, Livonia, MI 48150, <http://www.hiddeninc.com>*

Cryogenic temperature monitor

Lake Shore's new model 224 cryogenic temperature monitor offers up to 12 independent channels, making it suitable for users who need to measure multiple sensors and sensor types and require high sensitivity for cryogenic applications. It can be used in university and commercial research laboratories that need measurement flexibility in low-temperature applications. With 12 independently configurable inputs, model 224 can support simultaneous measurement of a system's various critical points. It has maximum monitoring capabilities for both higher-temperature and cryogenic applications such as leak detection; thermal gradient profiling; multiple stages within systems operating at different temperature levels; and multiple cryogenic refrigeration systems, including liquid nitrogen dewars, helium-4 cryostats, and closed-cycle refrigerators. *Lake Shore Cryotronics Inc, 575 McCorkle Boulevard, Westerville, OH 43082, <http://www.lakeshore.com>*

Dry vacuum roots pumps

Ulvac now offers the CR series of air-cooled roots-type dry vacuum pumps.

With no oil inside the pump head and no contact between rotor and cylinder, stable operation and extended lifetime are possible. The pumps are air-cooled for low running costs. They do not require cooling water or nitrogen gas; are airtight, lightweight, and compact; and feature low power consumption. Water vapor can be pumped down by using gas ballast. A silencer is integrated into the design. Applications include vacuum pumping of clean gases such as air and inert gas; water vapor pumping for vacuum dryer equipment (gas ballast is required); and use with vacuum equipment—for example, sputtering and evaporators. *Ulvac Technologies Inc, 401 Griffin Brook Drive, Methuen, MA 01844, <http://www.ulvac.com>*

Variable leak valve

Recently launched by VAT, the S59.0 variable leak valve features a novel all-metal mechanism design that allows for fine gas control and repeatability over a large pressure range. With no lubrication required during its specified lifetime, the valve is user friendly and low maintenance. A knurled manual actuator features a 22-full-turn range from leak tight through nine decades of flow



control. A linear and rotary visual scale is also provided. The valve is available with the manual actuator (knurled knot) or stepper motor driven. Closing is achieved by means of a mechanical stop to give a reliable leak-tight position without the risk of overtightening. The valve is bakeable to 300 °C in the closed position. *VAT Inc, 500 West-Cummings Park, Suites 5450-5650, Woburn, MA 01801, <http://www.vatvalve.com>* ■