

NEW PRODUCTS

Focus on cryogenics, vacuum equipment, materials, and semiconductors

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

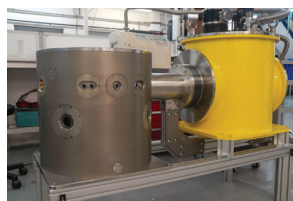


Electric angle valve

According to Pfeiffer Vacuum+Fab Solutions, its Series E electric angle valve for high-vacuum applications offers superior control, energy efficiency, reliability, and cost savings compared with other available products. Series E is suitable for critical high-vacuum isolation applications ranging from 10^{-3} to 10^{-9} mbar. An efficient 24 V_{DC} electric actuation system and robust elastomer seal ensure precise, reliable operation. Its fail-safe mechanism maintains safety during power losses, and a local mode permits manual operation during maintenance. Those features reduce mechanical stress and ensure consistent performance. The motor-controlled system uses less energy than traditional valves and thus helps reduce operational costs. Designed for easy integration, the right-angle structure enhances system compatibility and user-friendliness. **Pfeiffer Vacuum Inc**, 24 Trafalgar Sq, Nashua, NH 03063, www.pfeiffer-vacuum.com

Split cryostat

The Dry ICE Dyad from ICEoxford is a closed-cycle system capable of cooling to 1.4 K while providing excellent optical access and ultralow vibration. The sample unit is held separately from the cold head and the main body of the cryostat; to reduce vibration to less than 20 nm, the two are connected only by a soft thermal link. The sample space environment can be switched between a top-loading exchange gas module and a vacuum module within a couple of hours, which provides the flexibility needed for busy laboratories to address multiple applications. The Dyad features a 5 T split-pair magnet, and five windows with a short working distance provide optical access. It has a base temperature of 1.3 K and provides cooling powers of 50 mW at 1.5 K, 100 mW at 1.6 K, and 200 mW at 1.9 K. According to the company, the specifications of the system make it suitable for studies that may advance the boundaries of quantum optics. **ICEoxford**, Avenue 4, Station Ln, Witney, Oxfordshire OX28 4BN, UK, www.iceoxford.com



FTIR system with vacuum ATR accessory



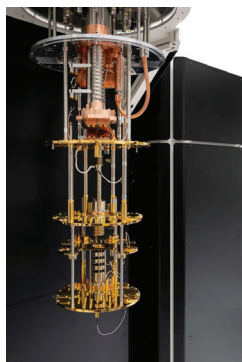
Bruker says that the first product in its new Vertex Neo platform, the Vertex Neo R, represents an advancement in high-end Fourier transform IR (FTIR) research instrumentation for academic and industrial R&D. The user-friendly instrument will enable researchers to explore new frontiers in fields such as catalytic investigations, battery-material development, and semiconductor research. The Vertex Neo R features Bruker's MultiTect detector technology and its first Vacuum ATR (attenuated total reflection) accessory. MultiTect offers broad spectral range detection; the Vacuum ATR builds on Bruker's Platinum ATR accessory, which uses a diamond crystal. It enables ATR measurements with the complete optical path under vacuum and full access to the crystal and the sample at the top of the instrument. That makes venting between measurements unnecessary and allows for complex scientific setups around samples. The ATR accessory enables measurements from the mid- to the far-IR and even the terahertz spectral region, and it is suitable for many types of samples, including solids and volatile liquids. **Bruker Optics Inc**, 40 Manning Rd, Billerica, MA 01821, www.bruker.com

Source measure unit for nanoscale devices



Lake Shore Cryotronics has unveiled the SMU-10, the newest module in its MeasureReady M81-SSM synchronous source measure system. According to the company, it is the first source measure unit optimized for nanoscale devices. Offering very low noise measurements with nanovolt and femtoamp precision, the SMU-10 is suitable for characterizing the ultralow voltage regimes of nanoscale and 2D nanomaterial semiconductors. It provides increased measurement sensitivity by thermal and offset reduction through AC measurement capabilities. Synchronous/simultaneous sourcing and measuring removes sampling misalignment, making the module appropriate for semiconductor I-V, or current-voltage, testing. The SMU-10 also features integrated lock-in detection capabilities. Incorporating six instruments into a unified solution, it provides DC-current, DC-voltage, AC-current, AC-voltage, lock-in, and resistance measurement capabilities. **Lake Shore Cryotronics Inc**, 575 McCorkle Blvd, Westerville, OH 43082, www.lakeshore.com

NEW PRODUCTS



Ultracompact dilution refrigerator

Bluefors has announced its Ultracompact LD dilution refrigerator system, an all-in-one cryogenic measurement system suitable for laboratories with limited space. Dilution refrigerators provide essential ultralow-temperature cooling for quantum devices, such as those used in quantum computing. The system integrates all components necessary for a dilution refrigerator: a Bluefors LD cryostat, its Gas Handling System Generation 2, and a pulse tube compressor. Using multiple dampening solutions to deliver low-vibration operation, the system generates sound levels that are 8–14 dB lower than the standard Bluefors LD. The Ultracompact LD makes installation, setup,

and operation simple and efficient with an integrated 19-inch rack that has space for additional measurement electronics and with doors that provide easy access to the gas handling system and pulse tube compressor. **Bluefors Oy**, Arinatie 10, 00370 Helsinki, Finland, <https://bluefors.com>

Cryogenic epoxy

Master Bond's EP29LPSPND-3, a two-component, nondrip epoxy compound with a paste consistency, can be used for bonding and sealing applications. The system is electrically nonconductive and thermally insulative, with a thermal conductivity of approximately 0.2 W/mK at room temperature. A key performance attribute is its ability to withstand temperature cycling even at cryogenic levels. It is serviceable in the range from 4 K to 394 K. The epoxy features a coefficient of thermal expansion of $45\text{--}50 \times 10^{-6}/^{\circ}\text{C}$, a tensile strength of 6000–8000 psi, and a Shore D hardness of 70–80. The system has a volume resistivity exceeding $10^{15} \Omega\text{-cm}$ at 75 °F and a dielectric constant of 4.2 at 60 Hz. It has a mix ratio of 100:65 by weight, with a long working life after mixing; a 100 g batch will yield an open time of greater than 5 h at 75 °F. Despite being a paste, it cures clear when applied in thin sections, with a refractive index of 1.56 at 589 nm. **Master Bond Inc**, 154 Hobart St, Hackensack, NJ 07601, www.masterbond.com



Turbomolecular pumps for high vacuum

With the Turbovac Mag 2807 iS and 3207 iS Maglev, Leybold introduces two compact turbomolecular pumps in the pumping speed class of 3000 l/s. Equipped with magnetic rotor bearings, the robust, low-vibration pumps are suitable for clean, hydrocarbon-free, high-vacuum conditions. They are suitable for scientific research fields that use accelerators, where clean, vibration-free operation is crucial, and for coating processes, such as the production of glass lenses. They can be used in R&D and industrial fields pertaining to electron beam processes, space-simulation chambers, and beamline applications. According to the company, the pumps offer an excellent ratio of maximum pumping speed to size: The Turbovac Mag iS delivers pumping speeds of up to 3200 l/s at a maximum gas throughput of 26 and 33 mbar l/s for argon and nitrogen, respectively. The lightweight pumps, at less than 60 kg,

can be installed in almost any position. Minimal wear allows for maintenance intervals of up to 80 000 h or 10 000 cycles. **Leybold GmbH**, Bonner Str 498, 50968 Cologne, Germany, www.leybold.com

Semiconductor process deposition system

ULVAC's Entron-EXX multichamber deposition system for semiconductor applications builds on its predecessor, the Entron-EX W300, to provide users with an optimized environment for development and mass production. The system integrates various process modules, such as precleaning, heating, cooling, and physical vapor, chemical vapor, and atomic layer deposition. It also features enhanced data collection and analysis capabilities and a scalable design. Real-time processing of large data volumes helps users improve yields, optimize preventative maintenance, and enhance operational efficiency. Because the highly expandable design enables quick module additions and swapping, the system can be easily adapted for evolving needs. The Entron-EXX offers two versatile platform options: single and tandem. The single platform features a single transfer chamber and a simple, space-efficient design. The tandem platform, with two transfer chambers arranged in sequence, is suitable for complex processes that require higher productivity. **ULVAC Technologies Inc**, 401 Griffin Brook Dr, Methuen, MA 01844, www.ulvac.com

