

NEW PRODUCTS

Focus on test, measurement, quantum metrology, spectroscopy, and spectrometry

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

Microspectrophotometer for materials analysis



Craic Technologies has announced its 2030XL PRO microspectrophotometer for the nondestructive analysis of microscopic areas of very large samples. The instrument features state-of-the-art optics, a new high-sensitivity spectrometer, and advanced software for fast, accurate data analysis. The flexible 2030XL PRO can analyze a wide range of materials, including semiconductors, flat-panel displays, and biological samples. Multiple measurement modes let users perform absorbance, reflectance, fluorescence, and Raman spectroscopy in one platform. Advanced

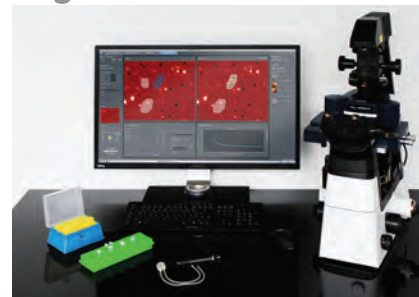
imaging capabilities allow researchers to visualize samples while obtaining spectroscopic data. The versatile 2030XL PRO is compatible with a wide range of accessories, including microscopes, probes, and sampling tools. **Craic Technologies Inc**, 948 N Amelia Ave, San Dimas, CA 91773, www.microspectra.com

FTIR spectrometer

To expand its molecular spectroscopy portfolio, Edinburgh Instruments has brought to market its first Fourier-transform IR (FTIR) spectrometer. The IR5 is offered with options that increase its functionality and make the compact instrument suitable for a wide variety of applications. It can be configured with a second detector to achieve higher sensitivity at selected spectral ranges or with a Fourier-transform photoluminescence (FT-PL) capability with a choice of laser source. The FT-PL option converts the IR5 into a combined absorption and PL spectrometer in the mid-IR range so that it can be used in demanding research applications. The IR5 features high sensitivity and spectral resolution; simple operation suitable for beginning to advanced users; moisture-control technology that eliminates the need for maintenance; and powerful, intuitive Miracle software designed specifically for the IR5. **Edinburgh Instruments Ltd**, 2 Bain Sq, Kirkton Campus, Livingston EH54 7DQ, UK, www.edinst.com



Force measurements for single-molecule research



Bruker's ForceRobot 400 BioAFM for force measurement features an increased level of automation and advanced optical techniques. It can be seamlessly integrated into the latest research-grade optical microscopes with advanced and super-resolution capabilities. The ForceRobot 400 generates over 250 000 force curves per day to deliver the statistically significant data sets required for demanding discovery and preclinical research. It offers advanced force-curve profiles and label-free, nanomechanical measurement of individual molecules in near-physiological conditions. The flexible SmartMapping functionality allows for the investigation of user-defined areas. To advance the design and synthesis of novel macro- and nanomaterials, the ForceRobot 400 enables the study of the mechanical properties of natural and synthetic polymers at the single-molecule level. The highly accurate motorized sample stage and large-scale Z-motors allow for the continuous evaluation and automated adaptation of the acquisition range. **Bruker Nano GmbH**, JPK BioAFM Business, Am Studio 2D, 12489 Berlin, Germany, www.jpk.com



High-density source measure unit

Keysight's new source measure unit (SMU) is designed to speed up semiconductor characterization. Featuring high-channel-density precision, the PZ2100 series SMU solution offers up to 20 SMU channels in a 1U full-width form factor that does not require cooling spacers when stacked. By simplifying channel stacking and synchronization, it not only removes integration and coding complexity but also saves time. The graphical user interface accelerates test prototyping, debugging, and troubleshooting, and the PathWave IV Curve measurement software enables quick measurements and synchronization without pro-

gramming. The compact, scalable PZ2100 series reduces cost by integrating pulser and digitizer functions with conventional SMU functions, such as precise DC voltage and current sourcing and measuring. Available in five SMU-configurable, upgradable options, the all-in-one module for integrated circuit design characterization meets emerging requirements without additional instruments. **Keysight Technologies Inc**, 1400 Fountaingrove Pkwy, Santa Rosa, CA 95403-1738, www.keysight.com



Broadband RF amplifiers for equipment testing

Rohde & Schwarz has expanded its BBA300 ultra-wideband RF amplifier family by adding a powerful 90 W model for its CDE and DE series products. The robust BBA300 amplifiers provide stable, precise test signals for electronic compatibility and coexistence testing and for testing components during development and production. They offer up to 250 W output power. The BBA300-CDE offers a continuous frequency range from 380 MHz to 6 GHz; the BBA300-DE operates from 1 GHz to 6 GHz. Their very broad

frequency range makes the amplifiers suitable for wireless and ultra-wideband applications. Software options let users optimize the transmission characteristics for specific applications so they can evaluate devices in multiple ways in a single test without changing equipment. Amplitude, frequency, phase, pulse, and complex orthogonal frequency-division multiplexing modulation modes are supported. **Rohde & Schwarz GmbH & Co KG**, Mühldorfstrasse 15, 81671 Munich, Germany, www.rohde-schwarz.com

Software for quantum computer integration

Quantum Machines and ParTec, located in Munich, Germany, have co-developed a universal software solution for the integration of quantum computers into high-performance computing (HPC) environments. According to the companies, QBridge is the first commercially available solution that enables multiple HPC users to seamlessly execute hybrid workflows across HPC classical and quantum computing resources. Tightly integrated with Quantum Machines' OPX classical-quantum controller, QBridge helps HPC users improve performance from hybrid classical-quantum systems. It allows for programming of advanced multiqubit algorithms that require robust classical processing. To provide insights into the quantum system and maximize usability, the QBridge quantum stack is transparent and flexible. It caters to various users, from circuit-level for algorithm developers to low-level pulse control for quantum researchers. **Quantum Machines**, HaMasger St 35, Tel Aviv-Yafo, 6721407, Israel, www.quantum-machines.co



Fiber laser for quantum research

NKT Photonics has launched its Koheras Adjustik HP T20 fiber laser optimized for barium ion ($^{138}\text{Ba}^+$) excitation at 1762.17 nm. According to the company, barium ions are suitable for quantum computing: It is easy to manipulate the ions' electrons with laser beams and use them as qubits. Designed specifically for

the 6S-to-5D transition in barium, the Koheras Adjustik HP T20 is a rack-mountable, benchtop, distributed-feedback (DFB) fiber-laser source. Based on the company's industrial Basik DFB fiber lasers, the Koheras Adjustik HP T20 is a stable, all-fiber, low-noise, mode-hop-free laser with a free-running linewidth of 10 kHz. It offers robust single-frequency operation and a high power of 500 mW at 1762.17 nm. The built-in fiber-delivery solution preserves the low-noise laser properties and delivers single-mode light at all wavelengths. The Koheras Adjustik HP T20 is suitable for such applications as qubit manipulation, quantum sensing, and sympathetic cooling. **NKT Photonics Inc**, 23 Drydock Ave, Boston, MA 02210, www.nktphotonics.com

Single-column universal testing machines

Mecmesin, a PPT Group brand, has added three single-column models with capacities of 0.5 kN, 1 kN, and 2.5 kN to its OmniTest range of universal testing machines (UTMs). The UTMs can perform static tensile and compression testing of metals, plastics, polymers, alloys, composites, wood, fabrics, glass, laminates, and ceramics in R&D and quality assurance in a wide range of industries. They occupy minimal bench space and, weighing less than 30 kg, can be easily transported. The 2.5 kN model is suitable for general-purpose testing; the 0.5 kN and 1 kN models have extended column lengths that make them appropriate for long-elongation, low-force testing. The company's VectorPro testing software drives the versatile OmniTest UTMs; the PC-driven model can run the test routines on users' chosen computer hardware. **Mecmesin/PPT Group UK Ltd**, Newton House, Spring Copse Business Park, Slinfold, West Sussex RH13 0SZ, UK, www.mecmesin.com



Semiconductor metrology

The latest version of Thermo Fisher Scientific's scanning transmission electron microscopy (STEM) metrology solution for high-volume semiconductor manufacturing improves average productivity by up to 20% compared with the previous-generation instrument. The Metrios 6 (S)TEM incorporates state-of-the-art hardware and machine-learning algorithms to rapidly obtain large-volume, high-quality data from complex devices and novel materials. New features and capabilities include the fully automated Smart Stage mechanism for sample insertion and retraction. By eliminating manual operation and thereby the potential for human errors, it speeds up high-resolution imaging. The company's new Ultra-X energy-dispersive spectroscopy (EDS) detection system offers fast compositional characterization and elemental mapping to ease challenging analysis on the most beam-sensitive materials. A newly designed objective lens and source innovations enable voltage switching in minutes versus hours, higher-efficiency STEM and EDS acquisition, and high resolution. **Thermo Fisher Scientific Inc**, 168 Third Ave, Waltham, MA 02451, www.thermofisher.com



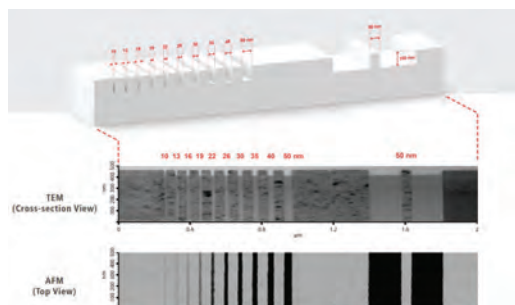
Universal streak camera

The C16910 universal streak camera from Hamamatsu is an ultrahigh-speed detector that captures light-emission phenomena occurring in extremely short time periods. Its temporal resolution is less than 800 fs. Combining a sweep unit and a function-expansion unit, the camera can detect a single photon and can measure various phenomena by capturing either single shots or multiple shots at high repetition rates. It features wavelengths from the UV to the near-IR and simultaneous measurement of light intensity on temporal and spatial (wavelength) axes. The internal multi-controlled-phase (MCP) gate improves the signal-to-noise ratio. By using the MCP

and the photocathode gates together, the camera can achieve an extinction ratio of 10^8 or more. Applications include fluorescence-lifetime measurement, optical communications, research involving free-electron and other types of pulsed lasers, plasma-light emission, and lidar Thomson scattering. **Hamamatsu Corporation**, 360 Foothill Rd, Bridgewater, NJ 08807, www.hamamatsu.com

Atomic force microscope for battery research

Oxford Instruments Asylum Research has introduced an atomic force microscope (AFM) configuration for battery research. The Cypher ES Battery Edition combines the ultrahigh-performance Cypher ES AFM with a fully sealed, three-electrode—working, counter, and reference—electrochemistry cell constructed from highly chemical-resistant materials. BlueDrive photothermal excitation is included and allows for simpler, more stable imaging in liquids; fast scanning enables the capture of dynamic processes. The Cypher ES Battery Edition features high stability and resolution even when integrated with a glove box for lithium battery research and is available with sample heating and cooling. A versatile tool, it can be used to optimize battery performance and characterize the electrode—electrolyte interface at the nanoscale. For example, it can monitor the formation and stability of solid—electrolyte interphases and probe electrical double-layer structures. **Oxford Instruments Asylum Research**, 7416 Hollister Ave, Santa Barbara, CA 93117, <https://afm.oxinst.com>



Traceable calibration standards

To facilitate accurate sample measurement and analysis, Park Systems now offers its NANOstandard product line for reliable calibration of atomic force microscope (AFM) and scanning electron microscope systems. According to the company, the Park NANOstandard is equivalent to NIST-traceable products for measuring the critical dimensions of semiconductor patterns, among other materials. The NANOstandard products include the AFM tip characterizer (AFMTC) and high magnification calibrator (HMC). Designed to evaluate the radius and half-cone angle of an AFM tip, the AFMTC calibration sample is nanopatterned with linewidths ranging from 10 nm to 50 nm.

The HMC standard sample is made of polycrystalline silicon and has five certified linewidth values ranging from 20 nm to 80 nm and five certified pitch values ranging from 100 nm to 900 nm. The standards conform to the Korea Research Institute of Standards and Science for ISO 17034:2016 and are traceable through the atomic lattice constant in the silicon substrate by high-resolution transmission electron microscopy. **Park Systems Inc**, 3040 Olcott St, Santa Clara, CA 95054, <https://parksystems.com> **PT**