New Products

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In order to supplement manufacturers' information, this Department will welcome the submission by our readers of brief communications reporting measurements on the physical properties of materials which supersede earlier data or suggest new research applications.
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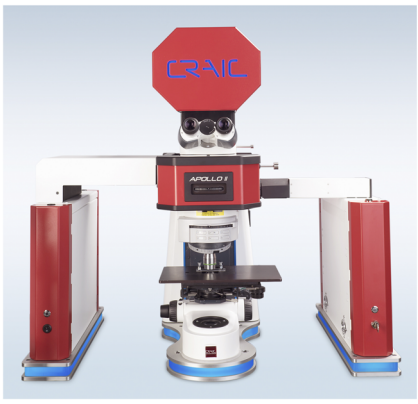
NEW INSTRUMENTS AND COMPONENTS

Photoluminescence microspectrophotometers

Craic Technologies now offers its microspectrophotometers with enhanced photoluminescence (PL) microspectroscopy and imaging. Users of Craic's 20/30 PV and Apollo II microspectrophotometers for research and quality control of photoluminescent samples can acquire photoluminescence spectra and images of microscopic sample areas throughout the ultraviolet (UV), visible, and near-infrared (IR) regions. PL-equipped Craic microspectrophotometers can be used to monitor the time dependences of those spectra using the company's kinetic TimePro software or to map the PL emission from large-scale objects with microscopic spatial resolution. Photoluminescence occurs when light is emitted from a sample after it absorbs photons from the microspectrophotometer's light source. Lasers in Craic's photoluminescence modules range from the UV to the near-IR. The laser is focused onto the sampling area, which emits light via luminescence, a process that encompasses fluorescence, phosphorescence, and other types of photonic emission. The emitted light is collected by the microspectrophotometer, and the spectrum is displayed. That type of experiment is not diffraction-limited, so Craic microspectrophotometers equipped for PL can measure samples much smaller than a micron—*Craic Technologies, Inc., 948 North Amelia Avenue, San Dimas, California 91773. (310-573-8180)* http://www.microspectra.com



Neutron imaging system

According to Photonis, its Neutronic [i] neutron imaging system provides high resolution and high detection efficiency compared with traditional scintillator-based neutron imaging systems. It uses both cold and thermal neutron imaging techniques to produce still and video images and is suitable for physics research, neutron scattering, neutron tomography, and nondestructive testing applications. To achieve neutron sensitivity, Neutronic [i] is equipped with a 100×100-mm^2 microchannel plate from Photonis and NeuView technology from Nova Scientific. It houses a vacuum chamber, a high-voltage power supply, and a controller. To protect the items being imaged from damage, the system provides short beam-time imaging. It can deliver actionable images in under 2 h, which represents a reduction in the beam time required to acquire an image by more than half, according to Photonis; traditional neutron imaging is often performed over a period of multiple hours. Neutronic [i] can be used with any neutron source and is easily connected to a camera for images via a mirror/lens/camera setup. The system can be changed, adjusted, or serviced as needed, making it suitable for smaller reactors or portable applications, in addition to its ability to free up additional beam time in larger facilities—*Photonis USA, Inc, 660 Main Street, Sturbridge, Massachusetts 01566. (508-347-4000)* https://www.photonis.com

Picosecond diode laser

Auréa Technology designed its Pixea-analytics picosecond laser for high performance and versatility. Based on gain-switched laser diode technologies, the Pixea-analytics offers various wavelengths from 375 nm to 1990 nm. It can generate ultrashort laser pulses down to 30 ps with very low timing jitter and high beam quality. The control unit can tune the repetition rate from single-shot to 80 MHz and the pulse width from the picosecond to the nanosecond range. The Pixea-analytics can be used for applications such as characterizations, time analysis, fluorescence excitation, and laser

seeding—*Auréa Technology, 18 rue Alain Savary, Besançon 25000, France. (+33 3 81 25 29 83)* http://www.aureatechnology.com

Linear motor stages

Physik Instrumente has added the V-508 family of 18 compact linear positioning stages with magnetic direct drive and absolute encoders to its PIMag series of high-dynamics linear motor stages. The stages are suitable for research and industrial applications, including metrology, testing, biotechnology, laser-beam control, photonics alignment, and microassembly. They provide travel ranges of 80 mm, 170 mm, and 250 mm. Two motor options are available: ironless for high resolution and smooth motion, and iron core for high force, acceleration, and velocity up to 1 m/s. The V-508 family features high-load, high-precision crossed roller bearings with anticreep cage-assist to prevent roller creep. Various incremental and absolute measuring linear encoders are available from 0.2 nm to 78 nm resolution. Absolute encoders provide the stage position to the controller immediately after power-up, with no referencing required and no possibility that encoder counts will be lost in electrically noisy environments. Smooth motion is provided directly by zero-wear, noncontact linear motors with no additional mechanical components such as drive screws and gearboxes that can add friction, vibration, and noise. In addition to electromagnetic three-phase and voice-coil linear motors, electro-ceramic linear motors are offered—*Physik Instrumente LP, 16 Albert Street, Auburn, Massachusetts 01501. (508-832-3456)* https://www.physikinstrumente.com

NEW DETECTORS, MEASUREMENTS, AND MATERIALS

Parametric test solution

Keysight Technologies has released the third generation of its P9000 series, a massively parallel parametric test system. The company claims that the improved system will increase test speed and lower the cost of research and development (R&D) and production of advanced semiconductor logic and memory integrated circuits. For example, with today's types of device structure and higher performance, the amount of parametric test data required per advanced technology node (≤20 nm) is greatly increasing. The P9000 system's new per-pin parametric test module, P9015A, performs fast capacitance measurements to address the trend of growing test volumes of capacitance due to multilayer interconnection and new device structure. Its enhanced direct-charge measurement technology enables the measurement of leaky capacitance in cutting-edge semiconductor processes and provides 100-pin parallel capacitance measurement to increase the test throughput. According to Keysight, the system delivers single capacitance measurements with good data correlation for various types of capacitance more than twice as fast as a conventional inductance, capacitance, and resistance meter—*Keysight Technologies, Inc., 1400 Fountaingrove Parkway, Santa Rosa, California 95403. (800-829-4444)* http://www.keysight.com

Spectrometer with double monochromators

PicoQuant has announced that its FluoTime 300 fluorescence lifetime spectrometer is now available with double monochromators for excitation and emission. Due to the very high stray light rejection of those monochromators, the spectrometer's signal-to-noise ratio (SNR) is increased to more than 29 000:1 (root mean square) using the standard water Raman test. Even samples with a very high scattering coefficient can now be studied with high sensitivity and temporal resolution. Both monochromators are offered with special features. An additional motorized filter wheel in the excitation monochromator can suppress the second order that could lead to parasitic signals. The emission monochromator can be used in two modes: additive and subtractive. The additive mode is suitable for applications that require an extremely high spectral resolution. Values as high as 0.15 nm can be reached and enable, for example, measurements of complex molecular systems, organic semiconductor hybrids, and up-conversion materials. The subtractive mode improves the temporal resolution of the spectrometer and is therefore the mode of choice for the study of very short fluorescence lifetimes. A combination of a picosecond pulsed diode laser and a PicoQuant PMA Hybrid detector lets the system reach an instrumental response function as short as 60 ps (full width at half maximum). That very narrow half-width allows for fluorescence lifetimes of below 10 ps to be resolved. Both double monochromators are controlled from FluoTime 300's user-friendly EasyTau system software. Switching between additive and subtractive modes requires only a single mouse click. The new double monochromators improve the sensitivity and temporal resolution of FluoTime 300 and make it suitable for use in materials and life sciences research, sensitive analytics, and other applications—*PicoQuant, Rudower Chaussee 29, 12489 Berlin, Germany. (+49-30-6392-6929)* https://www.picoquant.com

Ultrafast time-domain spectroscopy

Laser Quantum has launched its next-generation time-domain spectrometer, the Asynchronous Optical Sampling (ASOPS) Engine. It offers very fast acquisition speeds up to 20 kHz and high time resolution, well below 60 fs for the company's 1-GHz laser range and below 100 fs for its 84-MHz range. According to Laser Quantum, the high scan rate, very long measurement windows, and high time resolution cannot be achieved by conventional measurement techniques. The ASOPS Engine consists of 2 fs lasers, a TL-1000 ASOPS for offset frequency stabilization, an optical trigger unit, a high-speed balanced optical photoreceiver, a

personal computer housing the data acquisition card, and the company's HASSP-Scope software for measurement and analysis of time-domain data. It is suitable for low-noise, ultrafast time-domain spectroscopy, high-resolution terahertz (THz) spectroscopy, two-color pump–probe spectroscopy, and other applications. Together with the company's THz spectroscopy unit, the ASOPS Engine can be combined with its HASSP-THz, a versatile, powerful THz-spectrometer that can reach 100 dB SNR and high resolution with short acquisition times—*Laser Quantum USA, 47673 Lakeview Boulevard, Fremont, California 94538. (510-210-3034)* https://www.laserquantum.com

Arbitrary waveform generator (AWG)

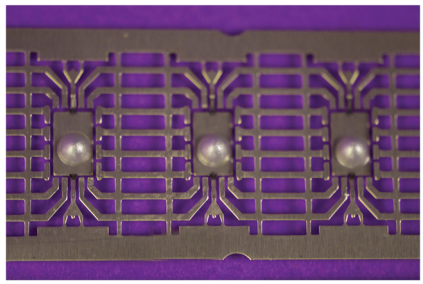
The SDR14TX dual-channel, 14-bit AWG from Teledyne Signal Processing Devices, part of the instrumentation segment of Teledyne Technologies, comes in various compact, modular form factors and has a sample rate of 2 Gigasample/s. It hosts a powerful field-programmable gate array that is open to the user, which allows for custom real-time signal processing that helps offload the host central processing unit. SDR14TX features DC-coupled outputs with high analog performance, which makes it suitable for wideband arbitrary waveform generation up to 1 GHz and for direct radio frequency synthesis up to the second Nyquist band (2 GHz). Its modularity enables scalable system-level solutions with high channel density, and high-precision synchronization allows for massive multichannel implementations. Selectable single-ended or differential outputs help simplify integration and optimize performance. Large onboard waveform memory, an advanced sequencing engine, and trigger capabilities enable pattern generation with precise timing. The AWG can be operated both under Windows and Linux. Applications include electron paramagnetic resonance, radar, lidar, wireless communication, scientific instruments, particle physics, semiconductor test, automated test equipment, test and measurement, and quantum technology—*Teledyne Signal Processing Devices Sweden AB, Teknikringen 6, Linköping, Östergötlands Län, Sweden 583 30. (+46 13465 06 00)* https://spdevices.com

Measuring laser microscope

The LEXT OLS5000 three-dimensional (3D) measuring laser microscope from Olympus scans laser light over a sample's surface to provide enlarged images of microscale features and perform shape measurements of surface roughness, steps, and other characteristics. It was designed for use in R&D and in industrial quality inspection and offers improved performance over the previous model. Combined with the Skip Scan function, the precise, accurate, and quick "PEAK" algorithm for 3D data construction can reduce data acquisition time by 75%, according to Olympus. The algorithm allows the microscope to rapidly detect surface topography at single nanometer accuracy with reliable precision. A 210-mm extension frame accommodates larger samples, and the ultralong working distance objective allows for measurement of dents up to 25 mm and inspection of challenging samples. To capture any surface at any angle, OLS5000 is equipped with 4 K scanning technology and enhanced optics that can capture steep slopes of up to 87.5°. Dedicated objectives perform uniform measurements across the entire field of view. A Smart Judge function distinguishes between steps on a sample and noise. Intuitive software can automate settings that previously had to be specified by the operator. The Smart Scan function and analysis templates automate the workflow and make it easy for even novice operators to work with the microscope—*Olympus Scientific Solutions Americas, 48 Woerd Avenue, #102, Waltham, Massachusetts 02453. (781-419-3900)* https://www.olympus-ims.com

Electrically conductive die-attach adhesive

Master Bond designed its EP3HTSDA-1 single-part, no-mix epoxy adhesive primarily for die attach applications in the communications, aerospace, medical, electronic, automotive, and defense industries. The epoxy exhibits a die shear strength/force of 20–22 kg and has a high thermal conductivity of over 5.7–6.5 W/(m K). The 100%-solid formulation has a suitable viscosity and flow for die attach and will not "tail." It can easily be dispensed automatically, has an unlimited working life at room temperature, and will cure in 20–30 min at 250 °F or 5–10 min at 300 °F. Master Bond EP3HTSDA-1 is NASA low-outgassing-approved. Dimensionally stable, it has a Shore D hardness of 75–85 and is engineered to withstand thermal cycling and shock. The epoxy system adheres well to metals, ceramics, and silicon dies. Its service operating temperature range is from −80 °F to +400 °F. The product contains silver fillers and has a volume resistivity of <0.001 Ω-cm. It retains conductivity upon aging, provides excellent moisture and chemical resistance, and is available in syringe applicators—*Master Bond, Inc., 154 Hobart Street, Hackensack, New Jersey 07601-3922. (201-343-8983)* http://www.masterbond.com



BIOINSTRUMENTATION AND BIOTECHNOLOGIES

Multi-line laser

Cobolt, a part of Hübner Photonics, has introduced its novel Cobolt Skyra multi-line laser platform. Skyra features up to four wavelengths permanently aligned in a single package that measures 70 × 134 × 38 mm. It does not require external electronics. Cobolt claims that it may enable the next generation of compact, easy-to-use analytical instrumentation for the life sciences. The laser is built using Cobolt's proprietary HTCure manufacturing technology to produce a robust, hermetically sealed package. HTCure yields an ultrastable, permanent alignment of optical elements with very precise, stable overlap of the combined output beams. According to Cobolt, that results in lasers that deliver high reliability and performance with demonstrated lifetime capability of >60 000 h in laboratory and industrial environments—*Cobolt AB, Vretenvägen 13, Solna, Sweden 171 54. (46 8 545 912 30)* https://www.coboltlasers.com

NEW FACILITIES AND HARDWARE

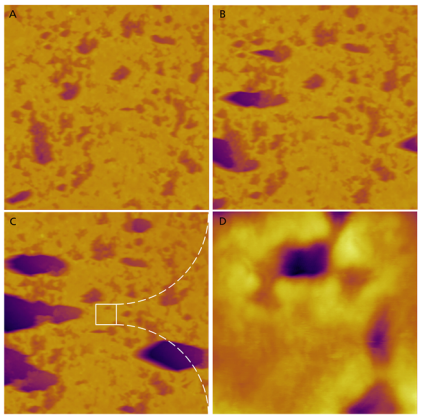
Multichannel USB data acquisition system

The iNET-600 data acquisition system series from Omega Engineering uses Windows software to directly connect many common sensor types to computers and controls via analog and digital inputs and digital outputs. The stand-alone system needs no additional components such as an external power supply. It receives power via USB. The iNET-600 features 16SE/8DI voltage input channels with an accurate 24-bit analog-to-digital converter that supports voltage ranges from ±20 mV to ±10 V. Each channel's range is independently software-programmable. The devices can also be attached to an optional wiring box. The system connects to resistance temperature detectors and to various sensors, including voltage, thermocouple, load cell, strain gauge, current, and resistance—*Omega Engineering, Inc., 800 Connecticut Avenue, Suite 5N01, Norwalk, Connecticut 06854. (888-826-6342 or 203-359-1660)* https://www.omega.com

NEW LITERATURE AND SOFTWARE

Electrochemical atomic force microscopy (AFM) for corrosion studies

Oxford Instruments Asylum Research has published an application note entitled: "Exploring Corrosion with Electrochemical AFM." The note discusses how combining an atomic force microscope with electrochemical capabilities can create a powerful tool for studying corrosion, oxidation, and mass transfer of metals at the nanoscale. It shows that the AFM can be used to study the nanoscale evolution of bias-dependent reactions in real time at the charge interface. Topics include how the measurement environment is controlled to mimic real-world corrosion conditions, time-lapse examples of corrosion mechanisms, and how the capabilities of Asylum Research's Cypher ES with a fully sealed electrochemistry cell, fast scanning, and blueDrive photothermal excitation can greatly improve both spatial and temporal resolution. The application note can be downloaded at http://www.oxford-instruments.com/AFM-corrosion-app-note.—*Asylum Research, 6310 Hollister Avenue, Santa Barbara, California 93117. (888-472-2795 or 805-696-6466)* http://www.asylumresearch.com



Multiparametric data acquisition software

CoMPASS multiparameter spectroscopy software from CAEN can implement multiparametric data acquisition for physics applications. Downloadable for free, CoMPASS supports data acquisition with CAEN digitizer family devices running the company's digital pulse processing algorithm. The detectors can be connected directly to the digitizers' inputs, and the software acquires energy, timing, and power spectral density (PSD) spectra at the same time. CoMPASS can manage multiple boards and event correlation between channels. It can apply energy and PSD cuts, simultaneously plot waveform, energy, time, PSD, and time-of-flight spectra, calculate and show statistics such as trigger rates and data throughput, and run saved output data files offline with different processing parameters—*CAEN quantum Security srl, Via Vetraia, 11, 55049 Viareggio (LU), Italy. (+39 0584 388 398)* http://www.caenqs.it

Optical signal analysis software

DPO7OE1 calibrated optical probe and analysis software for use with real-time oscilloscopes complements Tektronix's optical four-level pulse amplitude modulation (PAM4) analysis tools for sampling oscilloscopes used in optical device testing. The new solution is designed to give users efficient test solutions for all stages of the optical transmitter workflow. It offers 33 GHz of optical bandwidth for 28-GBaud PAM4 debug applications and can also be used for legacy nonreturn to zero (NRZ) applications. The new software is based on the operating principles of real-time oscilloscopes such as the company's model DPO70000SX. It allows R&D and system engineers to more easily troubleshoot optical devices by adding powerful debug capabilities: software clock recovery for PAM4 and NRZ, triggering, error detection, and the ability to capture the time correlated or contiguous record of a signal. Analysis packages support standard optical measurements, including extinction ratio, optical modulation amplitude, and eye height and width—*Tektronix, Inc., 14150 Southwest Karl Braun Drive, P.O. Box 500, Beaverton, Oregon 97077. (800-833-9200)* https://www.tek.com