

NEW PRODUCTS

Focus on lasers, imaging, microscopy, and nanoscience

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

Q-switched pulsed laser at 532 nm

Hübner Photonics now offers a new wavelength in its Cobolt Tor Series of high-performance, compact, air-cooled Q-switched lasers. The Cobolt Tor XE 532 nm delivers 0.25 mJ/pulse at up to a 1 kHz repetition rate. It offers short pulse lengths of 1–3 ns and excellent pulse-to-pulse stability for a passively Q-switched laser in a TEM₀₀ beam. Jitter is less than 2 μ s. Through advanced, fully integrated control electronics, the emission can be triggered from single pulses up to 1 kHz pulse trains, bursts of pulses using external or internal trigger signals, or a combination of both. The compact laser head contains all drive electronics. The Cobolt Tor XE 532 nm is designed for integration into instruments for marking, laser-induced breakdown spectroscopy, lidar, and photoacoustic microscopy applications. **Hübner Photonics Inc**, 2635 N 1st St, Ste 202, San Jose, CA 95134, <https://hubner-photonics.com>



Laser power and pulse-width stabilization system

Calmar has introduced a power and pulse-width stabilization system for its Carmel X-series of femtosecond fiber lasers. The OptaPower system is designed for users who need to measure extremely small signal levels and require hours for data acquisition. It ensures ultrastable power and pulse-width performance from the laser system for extended periods of time and irrespective of variations in the ambient temperature. Over a room-temperature change between 17 °C and 32 °C, OptaPower provides a twofold improvement in the rms pulse-width stability and an order of magnitude improvement in rms power stability. Carmel laser systems are used for nonlinear microscopy, cancer diagnostics, phototherapy, metrology, and other applications. **Calmar Laser**, 951 Commercial St, Palo Alto, CA 94303, www.calmarlaser.com



Cryogenic Raman imaging system

WITec and Attocube have jointly developed a system that makes Raman imaging at low temperatures in high magnetic fields accessible at high spatial resolution. CryoRaman integrates Attocube's cryostat and nanopositioner technology with WITec's sensitive, modular alpha300 correlative microscope series. It offers excitation wavelengths from visible to near-IR with optimized spectrometers, operating temperatures of 1.6–300 K, patented cryogenic Raman-specific objectives, and a precise piezoelectric scan stage. Optional modules include multiwavelength excitation capabilities, automated switching from optical microscopy to spectroscopic imaging, and time-correlated single-photon counting modes. CryoRaman also introduces to cryogenic Raman microscopy the ability to detect low-wavenumber Raman peaks and full polarization control in excitation and detection. **WITec Instruments Corp**, 130G Market Place Blvd, Knoxville, TN 37922, www.witec-instruments.com





Compact laser-diode modules with ultrathin lines

The HSML-E laser-diode module from Frankfurt Laser is very compact and delivers an ultrathin line. The laser head, whose dimensions are 12.6 mm × 44 mm, is 200 mm away from the laser driver, which is 12.6 mm × 40 mm. The laser driver operates at 24 V. As an example, the beam line can be focused to a thickness of just 10 µm at a distance of 40 mm. Standard fan angles are 10–90°. The wavelength ranges from 405 nm to 1060 nm with output powers of up to 50 mW. The power stability is typically less than ±5% over 8 h at an operating temperature range of 10–50 °C. The mod-

ules are optionally offered with a potentiometer for power adjustment, external transistor–transistor logic modulation up to 1 MHz, and analog modulation up to 100 kHz. The electrically isolated housing satisfies the protection class IP67, which means it can tolerate harsh conditions. Applications include laser triangulation, machine vision, scanning, and profiling. **Frankfurt Laser Company**, An den 30 Morgen 13, D-61381 Friedrichsdorf, Germany, <https://frlaserco.com>



Laser spectrum analyzer for IR applications

To support the spectral analysis of IR lasers, Bristol Instruments has added the 771 NIR2 to its laser spectrum analyzer series. The new instrument uses the original 771

series' Michelson interferometer technology with FFT analysis and offers the benefit of fiber-optic input. It is suitable for use by scientists and engineers who need to characterize the spectral properties of CW lasers that operate from 1.0 µm to 2.6 µm. The 771 NIR2 provides spectral resolution up to 2 GHz and measures wavelength to an accuracy as high as ±0.0002 nm. Its convenient fiber-optic input ensures optimal alignment of the laser under test and allows it to be placed in an out-of-the-way location to conserve optical bench space. **Bristol Instruments Inc**, 770 Canning Pkwy, Victor, NY 14564, www.bristol-inst.com

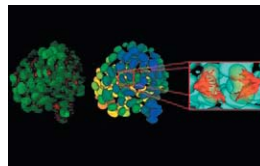


Software for surface analysis

Digital Surf has unveiled version 9 of its Mountains software platform for image and surface analysis in microscopy and metrology. Features include a new-look interface; analysis of multichannel cubes of compositional data; and surface-texture analysis on free-form surfaces, which makes it possible to calculate roughness on any type of nonplanar part, even on very complex shapes, such as shells. The company has also introduced several optional modules, including IV Spectroscopy, which uses scanning-probe microscopy to investigate electrical surface properties. Mountains 9 tools for statistical analysis can help users handle large quantities of measurement data and multiple data-population types. Version 9 comes with a new branch of Mountains software, MountainsSpectral, for correlation and spectroscopy analysis. **Digital Surf**, 16 rue Lavoisier, 25000 Besançon, France, www.digitalsurf.com

Autonomous image analysis

Leica Microsystems has announced that Aivia 10, the latest release of its artificial intelligence-powered image-analysis solution, is now available for a free trial on the Aivia Web platform. Featuring state-of-the-art machine-learning tools and deep-learning algorithms, Aivia software enables microscopy image visualization and analysis. Designed to allow researchers to get reliable results quickly by eliminating repetitive tasks, it provides a wide array of solutions, including 2D–5D image visualization and cloud-based model training modules. Trained by experienced human users, the new autonomous mode in Aivia 10 determines the parameters required for successful object recognition for each new image and makes expert-level segmentation and analysis of 3D images accessible for even untrained users. Upgrades in Aivia 10 include four new Active Tiles with optimized user interfaces for the most common tasks and improved file handling with faster image conversion and smaller file sizes for the fully documented Aivia TIFF 2.0 format. **Leica Microsystems Inc**, 1700 Leiden Ln, Buffalo Grove, IL 60089, www.leica-microsystems.com



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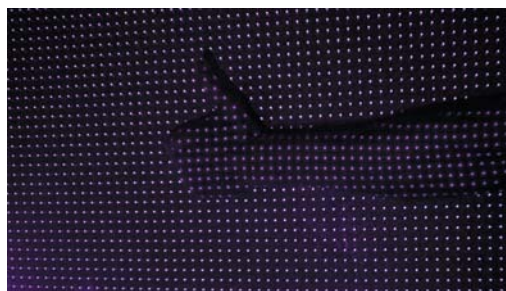
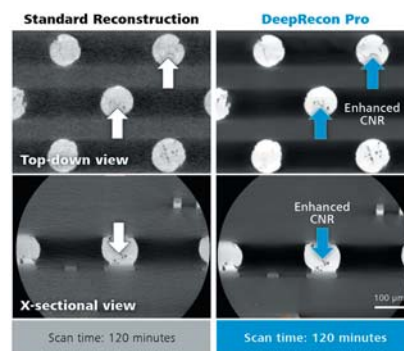
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X-ray 3D image reconstruction

Zeiss has made available two reconstruction technologies for the Advanced Reconstruction Toolbox (ART) on its Xradia 3D x-ray platforms. The DeepRecon Pro and PhaseEvolve modules use artificial intelligence to improve data collection and analysis and speed up decision making. The DeepRecon Pro and its custom variant increase throughput while producing better image quality and significantly reducing scan times. PhaseEvolve, a postprocessing reconstruction algorithm, enhances image contrast by revealing the material property variations uniquely capable of detection by x-ray microscopy. Both modules can improve image quality for many applications, typically 3D nondestructive sub-micron-resolution imaging and 4D *in situ* studies. The ART is suitable for academic and industrial users in fields such as electronics, battery and engineering materials, pharmaceuticals, geosciences, and semiconductor failure analysis. **Zeiss Research Microscopy Solutions**, Carl-Zeiss-Promenade 10, 07745 Jena, Germany, www.zeiss.com



Metalenses for ultra-compact optical sensors

Multifunctional metalenses from II-VI Inc are based on a proprietary platform that enables ultra-compact optical sensors for a broad range of applications, including ones in the life sciences, consumer electronics, and indus-

try. The metalenses are flat diffractive optical elements that can efficiently perform multiple optical functions on a single surface and operate over a broad range of wavelengths. In one implementation, II-VI's metalens both collimates and splits the light from vertical-cavity surface-emitting lasers (VCSELs) into a highly uniform grid of thousands of IR beams that are projected on a scene. Optical sensors reference those grids to accurately construct the scene in 3D. The metalenses can be used with the company's VCSELs to enable ultracompact 3D sensing cameras with high spatial resolution. **II-VI Inc**, 375 Saxonburg Blvd, Saxonburg, PA 16056-9499, <https://ii-vi.com>

Single-frequency deep-UV CW laser

CryLaS has extended its CW FQCW266 laser family by adding the frequency-converted 1000 model, which emits at the 266 nm wavelength with 1000 mW output power and $M^2 < 1.3$, for a single-mode TEM_{00} laser beam. The diode-pumped solid-state laser is air cooled.

By means of a novel high-efficiency resonant ring cavity and ultrahigh-purity nonlinear optical materials, the FQCW266-1000 operates in the deep UV and is highly stable at a single frequency and single spatial mode. The OEM design helps maintain not only the absolute wavelength over a prolonged emission time but also the stable beam pointing and propagation parameters over the laser's life span. The noise-suppression module eliminates spontaneous and triggered dropouts, which actively compensates for parasitic power fluctuations and significantly reduces the relative intensity noise over a wide range of the frequency domain of interest. Applications for the FQCW266-1000 include spectroscopy, analytics, lithography, and inspection. **Crystal Laser Systems GmbH**, Ostendstrasse 25, 12459 Berlin, Germany, www.crylas.de

