

NEW PRODUCTS

Focus on lasers and imaging

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. For all new products submissions, please send to Rnanna@aip.org.

Andreas Mandelis

Multiwavelength tunable diode lasers

Toptica Photonics has added 1050 nm, 1320 nm, and 1470 nm wavelengths to its continuously tunable laser (CTL) platform, thereby enabling continuous, mode-hop-free wavelength tuning up to 110 nm. Available at wavelengths ranging between 915 nm and 1630 nm, the CTL diode lasers can achieve ultrawide motorized wavelength scans with high absolute accuracy, subpicometer resolution, and output powers up to 80 mW. Piezo tuning allows for higher resolutions down to 5 kHz. With its novel resonator design and versatile, low-noise, all-digital DLC pro laser controller, the CTL reaches low drift values and a linewidth below 10 kHz. The controller offers functions such as zooming into spectra, frequency locking, and power stabilization. The CTL's new wavelengths support applications such as spectroscopy, waveguide characterization, ytterbium amplifier seeding, studying microresonators, and testing ytterbium fiber components. **Toptica Photonics Inc**, 1286 Blossom Dr, Victor, NY 14564, www.toptica.com



Picosecond pulsed laser

PicoQuant has rounded out its LDH and LDH-FA series of picosecond pulsed laser sources with the release of a fiber-amplified laser head that pulses at 560 nm. The series is used in time-resolved microscopy and spectroscopy applications such as fluorescence spectroscopy, fluorescence lifetime imaging, and fluorescence lifetime correlation spectroscopy. The 560 nm light emitted by the new LDH-P-FA-560 is suitable for exciting molecular probes used in the life sciences, including fluorescent proteins such as mCherry and red fluorescent protein and dyes such as CY3 and Atto565. The new laser head can also be used in bioanalytics, biochemistry, genetics, semiconductor characterization, and quality control applications. The LDH-P-FA-560 delivers average optical powers of more than 3 mW at a repetition rate of 40 MHz, with pulse widths down to 40 ps. The collimated free beam output can optionally be coupled to an optical fiber. **PicoQuant**, Rudower Chaussee 29, 12489 Berlin, Germany, www.picoquant.com



Near-IR line scan camera



Princeton Infrared Technologies now offers an OEM version of its indium gallium arsenide line scan camera. Designed for demanding imaging applications such as Raman spectroscopy and those in which objects are moving quickly, the USB3.0 SWIR OEM LineCam12 operates from 0.4 to 1.7 μm in the shortwave IR and visible spectra. It has USB3 Vision and Camera Link digital outputs and can be powered by USB3.0 in most applications. According to the company, the LineCam12 is the only SWIR line scan camera with USB3 Vision currently available, and the only USB3 camera that can image SWIR and visible light simultaneously. The 1024-element linear array can image over 37k lines/s. It comes in two models: One has 250- μm -tall pixels for spectroscopy, the other 12.5- μm -square pixels for machine vision tasks. They can be customized, including for high-temperature operation at 70 °C or very cold at -40 °C. **Princeton Infrared Technologies Inc**, 9 Deer Park Dr, Ste J-5, Monmouth Junction, NJ 08852, www.princetonirtech.com

Pulsed-laser wavelength meter



rate of 1 kHz—the fastest available, according to the company. A novel Fizeau etalon design is used to measure the wavelengths of both pulsed and CW lasers; automatic calibration with a built-in wavelength standard ensures optimal performance. The 871 system can operate from 375 nm to 1700 nm. Prealigned fiber-optic input provides for easy alignment and high accuracy. Automatic pulse detection triggers data collection for asynchronous operation. The model 871 operates with a PC running Windows via USB and Ethernet interface. Measurement data can also be displayed on a tablet or smartphone using a web-based application. **Bristol Instruments Inc**, 50 Victor Heights Pkwy, Victor, NY 14564, www.bristol-inst.com

Bristol Instruments has improved its 871 series pulsed-laser wavelength meter. It now has a wavelength accuracy as high as ± 0.75 ppm (± 225 MHz at 1000 nm), and an integrated proportional-integral-derivative controller that permits active regulation of laser frequency. The meter has a sustained measurement

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Video-rate atomic force microscope

The Cypher VRS video-rate atomic force microscope (AFM) from Oxford Instruments Asylum Research enables high-resolution imaging of dynamic events at up to 625 lines/s, corresponding to about 10 fps. According to the company, that is about 300 times as fast as typical AFMs and 10 times as fast as current “fast-scanning” AFMs. The modular, versatile Cypher VRS can be switched between video-rate and conventional scan speeds. It is suitable for researching nano-events such as biochemical reactions, membrane studies, and self-assembly, and for other materials and life sciences applications. Compatible with the environmental accessories for the company’s Cypher ES AFM, the Cypher VRS can be used for experiments with heating, cooling, and gas or liquid perfusion. Ease-of-use features include Asylum’s blueDrive photothermal excitation, designed to make tapping mode simpler and more stable and quantitative. **Oxford Instruments Asylum Research Inc**, 6310 Hollister Ave, Santa Barbara, CA 93117, www.asylumresearch.com

Optical power, energy, and position sensors

The versatile PEPS series of optical power, energy, and position quad-cell thermopile sensors from Newport can measure laser power, single-shot energy, and the position of a laser beam. When connected to a compatible Newport power meter—the 1919-R, 843-R series, and 841-PE-USB models—the detectors can track beams with 0.1 mm positional accuracy. They provide beam-tracking information such as the minimum and maximum X/Y positions, average position, and standard deviation. The PMManager software included with the detector allows for beam stability measurement. It produces a visual representation of the laser-beam drift over time in a 2D histogram. The data for the X and Y positions and the optical power can be logged and downloaded for further analysis or recording. **Newport Corporation**, 1791 Deere Ave, Irvine, CA 92606, www.newport.com



Camera with back-illuminated sensor technology

Princeton Instruments has introduced its Kuro:1200B scientific CMOS camera system with back-illuminated sensor technology. According to the company, that technology has been used almost exclusively by CCD camera systems. Though very sensitive, CCD systems cannot match CMOS frame rates, and front-illuminated CMOS cameras cannot meet the high-sensitivity needs of ultralow-light scientific imaging and spectroscopy. Princeton Instruments claims the Kuro delivers the fast frame rates and high sensitivity required for applications such as astronomy; hyperspectral, cold-atom, and quantum imaging; and fluorescence and high-speed spectroscopy. It also eliminates the drawbacks associated with front-illuminated sCMOS cameras. The Kuro does not require performance-limiting microlenses. It features ultralow-level read noise of $1.3 e^-$ rms median and frame rates of 82 fps at full 1200×1200 resolution. **Princeton Instruments**, 3660 Quakerbridge Rd, Trenton, NJ 08619, www.princetoninstruments.com

Wavelength-paired solid-state laser

Qioptiq, an Excelitas Technologies company, has added a 488/647 nm wavelength pairing to its iFLEX-Gemini dual-wavelength laser series. The 647 nm wavelength enables the use of specific fluorescence dye sets for superresolution microscopy and cancer research. The iFLEX-Gemini can be modulated internally. Each wavelength can be individually adjusted for output power and modulation repetition rate, and wavelengths will emit alternately or simultaneously on demand. The solid-state iFLEX-Gemini is one-tenth the size of equivalent argon-krypton gas lasers; the robust optomechanical design eliminates the need for laser realignment. It poses no toxic gas risk, requires no water-cooling or fans, and has a prolonged useful lifetime. Applications include DNA sequencing, flow cytometry, microscopy, optogenetics, and metrology. **Excelitas Technologies Corp**, 200 West St, Waltham, MA 02451, www.qioptiq.com

Lasers for materials and life sciences



Coherent has extended the performance of its Monaco series of femtosecond lasers by increasing the adjustable pulse repetition rate to a maximum of 50 MHz. The company has also launched a high-energy Monaco that provides up to $60 \mu\text{J}/\text{pulse}$ in the near-IR (1035 nm) or, optionally, $30 \mu\text{J}$ in the green (517 nm) region. The improvements are designed to enhance performance in precision materials processing applications, particularly for delicate and tough materials, and to deliver increased frame rates in demanding multiphoton microscopy imaging applications. The Monaco lasers produce a beam with a high collimation factor of M^2 less than 1.2; the beam enables tight focusing for high brightness and spatial resolution. Users can set the pulse width from under 400 fs to over 10 ps. In bioimaging applications, the new IR Monaco 1035-60 and green Monaco 517-30 enable high frame rates for applications such as photoactivation in optogenetic experiments. **Coherent Inc**, 5100 Patrick Henry Dr, Santa Clara, CA 95054, www.coherent.com

Software for scanning microscopies

WITec’s Suite Five software offers advanced functionality, accelerated workflow, and enhanced hardware control to help researchers perform Raman, atomic force, scanning near-field optical, and WITec correlative microscopy measurements. The Suite Five software wizard guides users from initial settings and data acquisition through data and image post-processing. Presets and highlighted analytical paths accelerate the generation of high-quality images. TrueComponent analysis, a novel post-processing function for confocal Raman imaging measurements, automatically establishes the number of components in a sample, locates them in the image, and differentiates their individual spectra. The EasyLink handheld multifunction controller provides a tactile, intuitive interface to direct motorized stages, white light illumination, laser power, autofocus, cantilever positioning, and objective selection with an automated turret. **WITec GmbH**, Lise-Meitner-Str 6, 89081 Ulm, Germany, www.witec.de **PT**