NEW PRODUCTS

Focus on lasers, imaging, and microscopy

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

Picosecond lasers

PicoQuant has added two modules to its VisUV pulsed laser platform. The VisUV-1064 emits picosecond pulsed laser light at 1064 nm with an average optical power of more than 1 W; the VisUV-532-HP provides high-powered subnanosecond pulses at 532 nm with an average optical power of up to 750 mW. While the existing short-pulsed—less than 70 ps—green and UV VisUV models best suit fluorescence lifetime spectroscopy and microscopy applications, the high-powered green and near-IR versions with broader pulse widths can be used for applications that require higher laser powers. Those include lidar and *in situ* Raman spectroscopy. The modules can be operated at internally selectable repetition rates between 31.25 kHz and 80 MHz or externally triggered at any repetition rate between 1 Hz and 80 MHz. The output beams feature a nearly perfectly circular and Gaussian-shaped profile with M^2 values below 1.3. ***PicoQuant**, Rudower Chaussee 29, 12489 Berlin, Germany, www.picoquant.com*

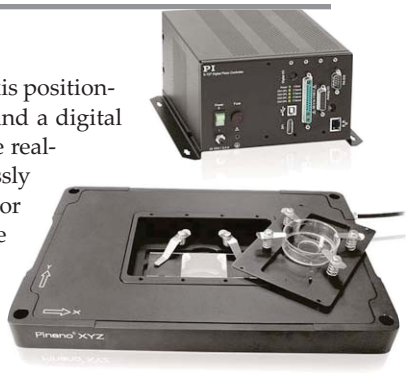
Pump laser fiber connector

Diamond has added a novel fiber-optic connector and mating adapter with an integrated electrical circuit breaker to its E-2000 connector line. The reliable interlock is useful for researchers who prefer a laser system that lets them block the emission by means of an external shutter rather than by changing the internal laser's driving conditions. It is particularly suitable for high-power applications or other situations in which light must be rapidly interrupted for safety reasons. The connector is available in several of the company's Power Solution (PS) optical interfaces, such as PS collimated, PSf free space, polarization-maintaining (PM)-PS, and PSm multimode. It supports all other standard features of the E-2000 family. Those include standard and small core fibers, PM and other specialty fibers, high-precision core placements, color and mechanical coding, and an automated metal protection cap. ***Diamond SA**, Via dei Patrizi 5, CH-6616 Losone, Switzerland, www.diamond-fo.com*

Automated IR microscope

With automated analysis functions and a wide-field camera option, the AIM-9000 IR microscope from Shimadzu Scientific Instruments enables users in fields such as electronics, life sciences, chemicals, pharmaceuticals, and forensics to observe, measure, and analyze micro samples quickly and efficiently. A 330× digital zoom "view to scan" feature lets users easily find and position microscopic samples. They can observe large areas up to 10 mm × 13 mm, and they can use the wide-field and microscope cameras together to zoom and position areas as small as 30 μm × 40 μm without losing or having to reposition the sample. A visible/IR dual-view system allows users to simultaneously measure IR spectra and check a visible image of the sample. With the microscope's 30 000:1 signal-to-noise ratio, excellent spectra can be obtained from very small contaminants. Proprietary spectral identification programming uses both library scans and key spectral features to match and identify spectra. ***Shimadzu Scientific Instruments**, 7102 Riverwood Dr, Columbia, MD 21046, www.ssi.shimadzu.com*

Piezo stage for imaging and microscopy



Physik Instrumente (PI) has released the second generation of its PInano line of XY/XYZ multiaxis positioning systems for high-resolution microscopy. The package includes a piezo scanner, software, and a digital servo piezo controller with high linearity and simple operation. The PInano provides responsive real-time tracking and supports PI's novel fast focus and freeze capability. It allows the unit to be seamlessly switched from an external focus sensor to an internal capacitive, strain gauge, or piezoresistive sensor for precise, calibrated, stable motions with respect to the focal plane. With their long travel range of 200 μm, millisecond step time, and low, 20 mm profile, the PInano II piezo positioning systems are suitable for superresolution microscopy and imaging applications. Six variations are available, including economical piezoresistive and high-end capacitive sensor versions and a high-speed model for particle tracking. ***Physik Instrumente LP**, 16 Albert St, Auburn, MA 01501, www.pi-usa.us*

Single-photon counting camera

The Imaging Photon Camera from Photonis is suitable for fast imaging under light-starved conditions, such as time-correlated single-photon counting. It features micrometer resolution, picosecond timing, a full 18-mm-wide field of view, and a count rate as high as 5 MHz with no added read noise. The very high counting rate is independent of timing and spatial resolutions. According to Photonis, the combination of novel microchannel plate detector technologies and fast electronics eliminates the problem of electron noise found in low-light digital sensor technologies such as electron-multiplying CCD and scientific CMOS. The company also says that in fluorescence lifetime imaging microscopy, the Imaging Photon Camera can determine each individual molecule's position, fluorescence time and diffusion, and dynamics at resolution levels unmatched by other commercially available imaging systems. The camera, which does not need subzero cooling, connects to any microscopy or imaging device via a standard C-mount. ***Photonis Netherlands BV**, Dwazziewegen 2, 9301 ZR Roden, PO Box 60, 9300 AB Roden, the Netherlands, www.photonis.com*

Ultracompact pulsed laser

Cobolt developed its Tor XS high-performance Q-switched laser for OEM integration into handheld or portable instruments used in applications of laser-induced breakdown spectroscopy. It operates at 1064 nm and uses the same laser cavity design as the existing Cobolt Tor. Despite its small size, the XS provides a novel combination of pulse repetition rates higher than 1 kHz, high average power up to 50 mW, short pulse lengths less than 3 ns, and high pulse-to-pulse stability. The emission is generated in a TEM_{00} beam and can be externally triggered from single pulse up to 1 kHz. The compact Cobolt Tor XS measures 50 mm × 29 mm × 21.4 mm and weighs less than 100 g. ***Cobolt AB**, Vretenvägen 13, SE-171 54, Solna, Sweden, www.cobolt.se*

Laser wavelength meter

Resolution Spectra Systems has developed a novel high-resolution laser wavelength meter for CW and pulsed lasers. Based on stationary-wave integrated Fourier transform spectrometer technology, the model LW-10 combines imaging sensors, integrated optics, and nanotechnologies with specific algorithms in a single, compact component with no moving parts. With its 20 MHz resolution and 200 MHz absolute accuracy, the meter can be used to accurately calibrate laser emission wavelengths over time. It also offers multiple software interface capabilities and optional calibration for use as a laser spectrum analyzer with a spectral resolution up to 3 GHz. The LW-10 is suitable for applications in the 700–1000 nm visible and near-IR ranges. They include tunable laser monitoring for CW titanium:sapphire and external cavity diode lasers, optical parametric oscillators, laser stability control, and frequency locking. ***Resolution Spectra Systems**, 13, chemin du Vieux Chêne, F-38240 Meylan, France, http://resolutionspectra.com*

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B.	*Paid subscriptions*		
1,2.	*Mailed subscriptions*	68 873	66 036
3,4.	*Sales through dealers and carriers, street vendors, counter sales outside USPS; other classes mailed*	15 587	14 468
C.	*Total paid distribution (sum of B1–B4)*	84 460	80 504
D.	*Free or nominal rate distribution*		
1,2.	*Free or nominal rate mail copies*	7 874	7 675
3,4.	*Free or nominal rate copies mailed at other classes or other distribution*	1 955	2 502
E.	*Total free or nominal rate distribution (sum of D1–D4)*	9 829	10 177
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D.	*Percent paid (both print and electronic copies) (B/C × 100)*	91.49%	90.93%

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I certify that the statements made by me above are correct and complete.

Randolph A. Nanna, Publisher

NEW PRODUCTS

Digital CMOS camera

According to Hamamatsu, its Orca-Flash4.0 V3 camera allows users to capture beautiful scientific images and perform experiments that require detection, quantification, and speed. Onboard field-programmable gate array processing enables intelligent data reduction. The camera features refined in-camera, pixel-level calibrations; increased USB 3.0 frame rates; novel triggering capabilities; and high image precision at low light levels. The patented Lightsheet Readout Mode uses scientific CMOS rolling shutter readout to enhance the quality of light-sheet images. When paired with the company's new W-View Gemini image-splitting optics, a single ORCA-Flash4.0 V3 camera becomes a dual wavelength imaging device: Each half of the sensor can be exposed independently and thus facilitate balanced dual-color imaging. That feature can be combined with the patented Dual Lightsheet Mode to make possible simultaneous dual-wavelength light-sheet microscopy. ***Hamamatsu Corporation**, 360 Foothill Rd, Bridgewater, NJ 08807, www.hamamatsu.com*

IR laser position sensing detector

Newport's CONEX-PSD sensing detectors are used for beam stabilization, laser tracking, and general beam diagnostics. The latest addition to the series, the CONEX-PSD10GE, has a 10 mm × 10 mm lateral effect sensor that can cover wavelengths from 800 nm to 1700 nm. According to Newport, unlike quadrant detectors that require overlap in all quadrants, the tetra-lateral-effect diode used in the CONEX-PSD series is highly linear over the full sensor size and provides accurate XY position information and relative power at any coordinate point. The company claims the CONEX-PSD10GE is the first commercially available position sensing detector for the IR range and is easy to use as a beam diagnostic tool for widely tunable IR lasers, including ultrafast. The detector has an analog input filter that suppresses undesired high-frequency noise and pulsed-laser-induced signal ringing. An included low-pass filter can be set with Newport's control software to further improve signal homogeneity. ***Newport Corporation**, 1791 Deere Ave, Irvine, CA 92606, www.newport.com*

Modular microscopy platform

Thorlabs has expanded its microscope line by adding the Cerna modular microscopy platform. Users can easily combine Thorlabs' optomechanical platform with their choice of more than 100 optical, electronic, motion control, and vision parts to construct an imaging system tailored to specific applications. Thorlabs provides interfaces to its standard optomechanical components, which include cage systems, lens tubes, and special breadboards. Those interfaces allow users to design a unique optical train. Each side of the rail incorporates a 95-mm-wide dovetail that mates directly with a selected microscope module. A system of circular dovetails provides compatibility with industry-standard optical components. With a throat depth of 19.65 cm, the Cerna platform provides a large working volume for sample apparatus and working space around the optical path. Modules are designed for wide-field observation, differential interference contrast, epi-illumination, and other imaging modalities. ***Thorlabs Inc**, 56 Sparta Ave, Newton, NJ 07860, www.thorlabs.com*

Imaging spectrograph

Fergie, Princeton Instruments' compact, multipurpose spectrograph for aberration-free imaging, allows users to quickly design experiments with the company's LightField software and a line of accessories such as lasers, fiber optics, calibration sources, and light-coupling Fergie Cubes. Fergie's spectral resolution is 0.13 nm/pixel with a 1200 g/mm grating. Diffraction-limited imaging of spatial resolution greater than 60 lp/mm throughout the focal plane yields high signal-to-noise ratios and permits multichannel spectroscopy. A built-in, low-noise, cooled detector allows high-sensitivity spectral capture from 190 nm to 1100 nm. Proprietary eXcelon-enabled CCDs are available with deep-depletion technology for enhanced near-IR sensitivity. Fergie is suitable for microspectroscopy and various other spectroscopies: Raman, absorption, transmission, and time-resolved. ***Princeton Instruments**, 3660 Quakerbridge Rd, Trenton, NJ 08619, www.princetoninstruments.com*

Scientific CMOS camera

Photometrics and Gpixel have introduced the Prime 95B scientific CMOS camera. They claim it is three times more sensitive than currently available sCMOS sensors and has a greater signal-to-noise ratio than electron-multiplying CCD cameras. The Prime 95B is built on the TVISB version of Gpixel's GSENSE 400 BSI backside-illuminated sCMOS image sensor. The sensor features a peak quantum efficiency (QE) of 95%, single-electron noise, and a dynamic range of more than 90 dB and has no need for deep cooling. With its high QE and 11 μm × 11 μm pixel area, the Prime 95B collects nearly all available light, maximizes the signal-to-noise ratio, and minimizes cellular photo damage. It captures images using the full microscope field of view at over 41 fps with 16-bit images and 82 fps with 12-bit images. The camera is suitable for such low-light microscopy techniques as single-molecule fluorescence, confocal imaging, and super-resolution microscopy. ***Photometrics**, 3440 East Britannia Dr, Ste 100, Tucson, AZ 85706, www.photometrics.com*

Ultracompact laser

Quantum Composers has launched its ultracompact, neodymium-doped yttrium aluminum garnet MicroJewel laser. Measuring 7.6 cm in length and weighing 40 g, it is the smallest member of the company's laser product line. It is suitable for integration into systems that require a small footprint or into handheld or mobile units. The passive Q-switched laser has an end-pumped diode, with efficient heat dissipation for the diode and laser rod. It delivers up to 8 mL at 1064 nm and can be used in various laboratory and industrial applications, including laser radar, laser-induced breakdown spectroscopy, particle image velocimetry, and cube satellite systems. ***Quantum Composers Inc**, 212 Discovery Dr, Bozeman, MT 59718, www.quantumcomposers.com*

Multispectral wheel camera

Pixelteq has introduced the SpectroCam VIS-SWIR 640 multispectral imaging camera. It is suitable for short-wave IR (SWIR) imaging in tissue and biological material analysis for medicine and forensics, pigment and object analysis for cultural heritage applications, and quality analysis of produce for agriculture applications. The SpectroCam features an indium gallium arsenide sensor for increased sensitivity, full-frame 640 × 512 pixel resolution, and a 15 μm pixel pitch, and it can produce live processed images of six spectral bands at a rate of 25 fps. The lightweight, portable camera is powered by easy-to-use software that allows for fast setup. Pixelteq has also expanded its selection of SWIR filters, which are available in mounted versions for the SpectroCam filter wheel and in custom round or rectangular formats for specific application needs. ***Pixelteq**, 8060 Bryan Dairy Rd, Largo, FL 33777, http://pixelteq.com* PT