

# 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](mailto:ptpub@aip.org).

**Andreas Mandelis**

### Laser wavelength characterization

The 238 Series optical wavelength meter from Bristol Instruments offers broad wavelength coverage combined with precise characterization of tunable transmitter lasers, distributed-feedback lasers, and vertical-cavity surface-emitting lasers. Those lasers are used in a wide variety of applications, including fiber-optic communications, data storage, and 3D sensing. With an operational range from 700 nm to 1650 nm, the 238 Series is available in two versions: The model 238A provides the more precise wavelength accuracy,  $\pm 0.3$  pm; the model 238B provides an accuracy of  $\pm 1.0$  pm. The meters feature continuous calibration with a built-in laser-wavelength standard to ensure reliable test results and a rugged optomechanical design for dependable long-term operation. **Bristol Instruments Inc**, 770 Canning Pkwy, Victor, NY 14564, [www.bristol-inst.com](http://www.bristol-inst.com)



### Laser diodes with automatic power control

A series of 520 nm green laser diodes from Arima Lasers, a Laser Components supplier, features eye-safe operation. The integrated automatic power control switches off the laser source as soon as a certain operating current level is exceeded. The chip contains the electronics as an application-specific integrated circuit and as a photodiode. The laser diodes are installed in a 3.3 mm housing, which protects

them from electrostatic discharges up to 10 kV. Depending on the model, they guarantee a stable output power of 5 mW or 10 mW at supply voltages of 5.8 V to 7.0 V (DC). Their pulse width can be modulated up to 2 MHz. **Laser Components USA Inc**, 116 S River Rd, Bldg C, Bedford, NH 03110, [www.lasercomponents.com](http://www.lasercomponents.com)



### Scientific imaging camera

Atik Cameras has released the first in its series of highly sensitive cameras for advanced scientific and industrial imaging. The model TE-77 uses the Tele-dyne e2v CCD77-00 sensor, which features  $24 \mu\text{m}^2$  pixels over a  $12.3 \text{ mm}^2$  sensor area. Because the camera can be reliably cooled to  $-60^\circ\text{C}$ , it can achieve very low read noise and detect the faintest signals. Minimal saturation and exceptional detail are achieved as a result of the deep full-well depth of  $300\,000 \text{ e}^-$  (summing-well depth of  $600\,000 \text{ e}^-$ ). Another key feature of CCD technologies is asymmetric binning to achieve even greater detail. Multiple options are available, including a 45 mm bistable, high-speed scientific shutter capable of 20.0 ms opening times. The TE-77 is suitable for demanding applications such as chemiluminescence, fluorescence, spectroscopy, microscopy, and bioluminescence imaging. **Atik Cameras Ltd**, Unit 8, Lodge Farm Barns, New Road, Norwich NR9 3LZ, UK, [www.atik-cameras.com](http://www.atik-cameras.com)

### Laser for deep-UV Raman spectroscopy

According to Toptica, its TopWave 229 CW laser is a suitable excitation source for deep-UV Raman and deep-UV fluorescence spectroscopy. Key features include its short wavelength, ultranarrow laser linewidth of less than 1 MHz, and output power of 10 mW at 229 nm. For fluorescence-free Raman, excitation below 250 nm is crucial for avoiding the overlap between the spectral regions of the Raman signal and the native fluorescence. In fluorescence spectroscopy, the

228.5 nm emission allows the detection of molecules with fluorescence spectra of less than or equal to 270 nm, which can only be excited with shorter-wavelength light. As a CW laser system, the TopWave 229 is free of the nonlinear and saturation problems common with pulsed-laser sources. To ensure high reliability and consistent, diffraction-limited beam quality ( $M^2 < 1.3$ ), the complete UV beam path is enclosed in a specially sealed compartment. **Toptica Photonics Inc**, 5847 County Rd 41, Farmington, NY 14425, [www.toptica.com](http://www.toptica.com)





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The Photo Injector Test Facility at DESY in Zeuthen (PITZ, near Berlin) focuses on the development of high brightness electron sources for Free Electron Lasers (FELs) such as FLASH and the European XFEL as well as on applications of high brightness beams like the world's first THz SASE FEL and unique research capabilities for tumor radiotherapy and radiation biology. We are looking for a senior scientist with strong theoretical and experimental background in accelerators, who will play a leading role in the further development of the research fields together with local and international cooperation partners.

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For further information please contact Dr. Frank Stephan at +49 33762 7-7338 ([frank.stephan@desy.de](mailto:frank.stephan@desy.de)).

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## NEW PRODUCTS

### UV-laser modules



A new 375 nm

UV-laser module in the Photon laser range from ProPhotonix is available in power levels up to 70 mW. The Photon laser is suitable for applications that require fast curing from a very focused UV light and for 3D printing applications, many of which currently use 405 nm lasers. The shorter wavelength allows the use of resins that are not as light sensitive, which reduces waste and the need to shield the resin from environmental light to prevent accidental curing. Available add-ons include various optical, CW, and modulation options; adjustable optics; and an enhanced boresight. They allow the compact, reliable Photon laser modules to be configured to address a range of applications. Those include particle analysis, since the shorter wavelength allows smaller particles to be detected and measured. **ProPhotonix Ltd**, 13 Red Roof Ln, Ste 200, Salem, NH 03079, [www.prophotonix.com](http://www.prophotonix.com)

### Benchtop confocal microscope



Andor Technology, an Oxford Instruments company, says its BC43 benchtop confocal microscope represents breakthrough instrumentation. Typically, microscopes that capture images in 3D are costly, complex to use, and located in specialized darkroom facilities. That is especially true for confocal technology, which delivers the highest-quality 3D images, particularly in thick and clinical specimens. The BC43 overcomes those challenges by delivering 2D confocal images in milliseconds and generating 3D views in real time. The compact design means it can sit on a bench in a regular laboratory, saving space and time. The cost-effective BC43 is simple to use but can address complex imaging needs for live and fixed specimens. It handles a range of scales, from the subcellular and single-cell levels through those of huge tissue samples and large model organisms. **Andor Technology Ltd**, 7 Millennium Way, Springvale Business Park, Belfast BT12 7AL, UK, <https://andor.oxinst.com>

## Scientific CMOS camera with high quantum efficiency

Thanks to its back-illuminated image sensor, the pco.edge 10 bi CLHS scientific CMOS camera from PCO, an Excelitas company, delivers a quantum efficiency of up to 85% and a broad spectrum out to the near-IR. The sensor incorporates microlenses and a full-pixel-height deep-trench isolation for cross-talk suppression, which results in a high modulation-transfer function. By using a high-resolution 10.5-megapixel image sensor with a square pixel size of  $4.6\text{ }\mu\text{m}$ , the camera provides a large image circle. Thermal stabilization and active sensor cooling produce a very low dark current and readout noise of  $0.8\text{ e}^-$ . The sensor technology reduces the noise peak and tail to a level comparable to the noise behavior of CCD sensors. Together with a high full-well capacity, that yields a dynamic range of 25 000:1. The pco.edge 10 bi camera offers high frame rates, of up to 120 fps, and transmission via a fiber-optic link. It is suitable for applications in microscopy and the life and physical sciences. *PCO AG, Donaupark 11, 93309 Kelheim, Germany, [www.pco.de](http://www.pco.de)*



## Compact, piezo-based objective positioning systems

PI (Physik Instrumente) has redesigned its portfolio of compact vertical positioners for microscope objectives, known as PIFOCs. They are suitable for integration in objective revolvers of upright and inverse microscopes. The new P-725 piezo-based lens scanners offer higher dynamics due to optimized levers and steel mounts and are available in three travel ranges:  $100\text{ }\mu\text{m}$ ,  $400\text{ }\mu\text{m}$ , and  $800\text{ }\mu\text{m}$ . Handling of the PIFOCs has been optimized:

The aperture has the largest possible diameter, and a set of adapter rings can be used to screw in different objectives up to M34 in size. A new cable sheathing makes possible much tighter-bending radii, which help protect the signal- and current-carrying cable from the mechanical strain induced by repeated rotations of the nosepiece to change magnification. The PIFOCs can be used in the life sciences, materials microscopy, quality assurance, and the semiconductor industry. *PI (Physik Instrumente) LP, 16 Albert St, Auburn, MA 01501, [www.pi-usa.us](http://www.pi-usa.us)*

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### Atomic-force-microscopy imaging mode

Nanosurf has announced a new atomic-force-microscopy (AFM) imaging mode available exclusively on the company's DriveAFM platform. According to Nanosurf, WaveMode is the fastest force-curve-based imaging mode that can be applied to all samples and all environments. It is based on CleanDrive, Nanosurf's exclusive photothermal cantilever actuation, which provides stable, low-drift, and high-signal-to-noise cantilever tunes that are insensitive to changes in the environment. WaveMode represents the first commercially available off-resonance mode that can use photothermal actuation of the cantilever—instead of traditional piezoelectric

actuation—to enable fast, stable, and gentle imaging. WaveMode offers fully automated laser and photodetector alignment. Usable in both liquid and air environments, it is suitable for AFM imaging in life and materials sciences applications. **Nanosurf AG**, Gräubernstrasse 12, 4410 Liestal, Switzerland, [www.nanosurf.com](http://www.nanosurf.com)

### Cooled CCD camera

Raptor has added the Eagle 1MP to its range of cooled CCD cameras. With a back-illuminated CCD sensor from Teledyne e2v (CCD47-10) providing  $1056 \times 1027$  pixels with  $13 \mu\text{m} \times 13 \mu\text{m}$  pixel pitch, the Eagle 1MP enables large-field-of-view imaging and ultrasharp image resolution. It is housed in Raptor's proprietary PentaVac vacuum enclosure and cooled to  $-90^\circ\text{C}$  with air and liquid and  $-80^\circ\text{C}$  with only air to minimize dark current for longer exposures. Using low-noise electronics, the Eagle 1MP offers less than  $2.3 \text{ e}^-$  readout noise unbinned and programmable binning options up to  $16 \times 16$  pixels and dual readout rates of 75 kHz and 2 MHz. It comes with a C mount and an integrated shutter, which is closed during readout to avoid vertical smear. According to the company, at  $140 \text{ mm} \times 126 \text{ mm} \times 120 \text{ mm}$ , the Eagle 1MP is the smallest camera in its class. **Raptor Photonics Ltd**, Willowbank Business Park, Larne, Co Antrim BT40 2SE, Northern Ireland, UK, [www.raptorphotonics.com](http://www.raptorphotonics.com)



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### Nanoscale IR imaging platform



Bruker has launched its Dimension IconIR nanoscale-IR-spectroscopy and chemical-imaging system. It combines the company's Dimension Icon atomic force microscope and nanoIR photothermal AFM-IR technology to generate chemical and material property mapping with a chemical-imaging resolution of less than 10 nm. The IconIR incorporates Bruker's proprietary PeakForce Tapping mode, which is both sensitive and robust and allows for the study of complex systems with strong mechanical heterogeneities. The standard system supports samples up to 150 mm; versions for larger samples are also available. According to the company, the platform constitutes the most complete correlative microscopy solution for quantitative nanochemical, nanomechanical, and nanoelectrical characterization. It is suitable for research in a broad range of polymer, geoscience, semiconductor, and life sciences applications. **Bruker Nano Surfaces**, 3400 E Britannia Dr, Ste 150, Tucson, AZ 85706, [www.bruker.com](http://www.bruker.com)

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