

Focus on lasers, imaging, nanoscience, and nanotechnology



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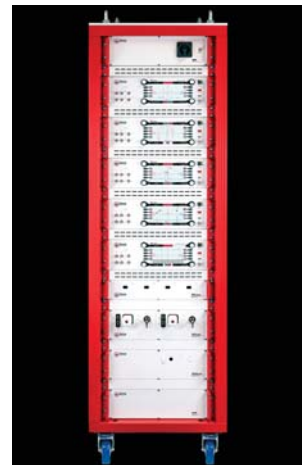
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The descriptions of the new products listed in this section are based on information supplied to us by the manufacturers. PHYSICS TODAY can assume no responsibility for their accuracy. For more information about a particular product, visit the website at the end of its description. Please send all new product submissions to ptpub@aip.org.

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Pulsed and CW laser diode drivers

Lumina Power has introduced the second generation of its precision pulsed laser diode drivers. The two models of the LDP series provide the option of either 1000 W or 2000 W average output. Both incorporate new technology that increases reliability and enhances pulsed performance while reducing circuit complexity and system size. Pulse widths of 50 μ s through CW operation and 10 μ s rise/fall time can now be achieved at repetition rates to 5 kHz, with higher rates optional. The LDP drivers feature output currents to 400 A, output power to 80 kW peak, and compliance voltages to 200 V with universal input voltage and an auxiliary ± 15 V output. **Lumina Power Inc**, 26 Ward Hill Ave, Bradford, MA 01835, <https://luminapower.com>



Laser rack systems

Laser modules suitable for quantum technologies are now available from Toptica in a footprint appropriate for industrial rack integration. The novel product family includes narrow-linewidth tunable diode lasers, amplified and frequency-converted diode lasers, frequency combs, and related accessories. The T-Rack—Toptica's rugged 19-inch cabinet with a modular power-entry unit, professional cable, and heat management system—can house multiple modules. The laser modules consist of a laser head with fiber-coupled optical output from 330 nm to 1625 nm. They are equipped with the company's DLC pro digital laser controller. They can be remotely controlled and, according to Toptica, offer convenient, reliable operation and high performance that previously was only possible in research-grade laboratories on optical tables. Applications include quantum computing and simulation; quantum metrology and optical clocks; and quantum sensing, optics research, and communications. **Toptica Photonics Inc**, 5847 County Rd 41, Farmington, NY 14425, www.toptica.com

Versatile benchtop electron microscope

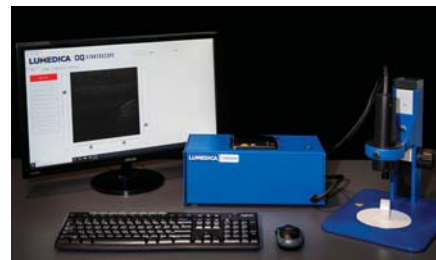
The LVEM 5 low-voltage electron microscope from DeLong Instruments combines four imaging functionalities into one benchtop apparatus suitable for use in life and materials sciences. With the click of a button, users can switch among modes to image the same sample region of interest. The LVEM 5 microscopes can be equipped with a CCD or scientific CMOS camera for transmission electron microscope (TEM) imaging of nanoparticles and thin sections. Accord-



ing to the company, the LVEM 5 is the only available benchtop TEM. Users can add a scanning detector to the TEM to obtain transmission images from denser materials. A backscatter electron detector offers a stereoscopic view of the sample; the scanning electron microscopy mode can be used to view the same area for topographical information. The electron diffraction mode provides structural characterization of crystalline materials. With its 5 kV electron source, the LVEM 5 can provide high contrast of organic and other soft materials without the need for heavy-metal staining. **Delong America**, 4020 Rue St-Ambroise, Ste 473, Montreal, QC H4C 2C7, Canada, www.lv-em.com

Deeply penetrating optical coherence tomography

At 1310 nm, Lumedica's OQ StrataScope penetrates about twice as deep as the company's 840 nm optical coherence tomography imager, the OQ LabScope. With a depth resolution of 14 μ m in air and 10 μ m in tissue, the OQ StrataScope also produces more imaging data from industrial samples, such as silicon, and from tissue, such as skin, bone, and teeth. It can be used to precisely examine, monitor, and measure tissue structures and to gauge product integrity. The flexible instrument features horizontal, vertical, radial, and circle scan options. Size can be set for all scan types. Volume images (C-scans) range from 64 \times 64 voxels to 512 \times 512 voxels. The mechanical scan ranges are 7 mm linear and 5 \times 5 mm volume. The compact OQ StrataScope is quick to set up, simple to operate, and easy to connect to user networks via built-in Wi-Fi. **Lumedica**, 701 W Main St, Ste 200, Durham, NC 27701, www.lumedicasystems.com



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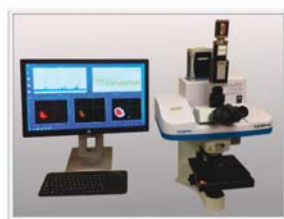


Laser source for photoacoustics

EKSPLA now offers a high-energy laser source that features a large sample imaging depth and resolution for photoacoustic imaging applications. The PhotoSonus+ consists of a high-energy Q-switched laser, parametric oscillator, power supply, and cooling unit, all integrated in a single robust cart-type housing. It delivers up to 250 mJ of pulse energy at a 10 Hz repetition rate. With the fast switching option, consecutive laser pulses can be generated at different wavelengths within the entire signal or idler range, at any step, and in any order. That feature, which combines a high pulse energy of up to 250 mJ and a wide wavelength tuning range of 660–2300 nm, makes the PhotoSonus+ a suitable imaging source for photoacoustic systems. For user convenience, the output of the PhotoSonus+ laser can be outfitted with various types of customized fiber bundles. **EKSPLA**, Savanoriu Ave 237, LT-02300 Vilnius, Lithuania, <https://ekspla.com>

Lasers with short rise times

Laser Components has enlarged its vertical-cavity surface-emitting laser (VCSEL) product line to include emitters with 850 nm and 940 nm in power classes between 200 mW and 50 W. In VCSELs, light is emitted perpendicular to the chip's surface and can therefore be easily collimated. The compact multimode lasers' high power and short pulse sequences ensure extended range and higher resolution and make them suitable for lidar applications, among others. The products are characterized by extremely short rise times and thus support pulse trains in the low nanosecond range and below. The semiconductor structure enables the emission wavelength to remain nearly constant, even with temperature fluctuations. That allows narrow bandpass filters to be used on the detector side. The laser diodes are also available as powerful arrays. **Laser Components USA Inc**, 116 S River Rd, Bldg C, Bedford, NH 03110, www.lasercomponents.com

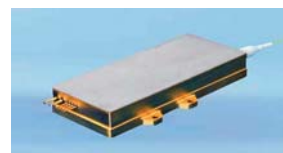


Raman nanoparticle analysis

Horiba Scientific has announced products that combine its Raman microscopes with CytoViva's hyperspectral imaging microscopy module and enhanced dark-field (EDF) illumination. They are designed to make Raman analysis faster and more powerful and may advance applications related to nanomaterials research, drug delivery, nanotoxicology studies, and surface-enhanced Raman spectroscopy nanoparticle characterization. Hyperspectral microscopy allows rapid imaging with high sensitivity across the sample. The patented CytoViva EDF illumination improves the signal-to-noise ratio up to 10 times over standard dark-field microscopes and permits visualization of nanoparticles as small as 10 nm when isolated. Users can rapidly view the sample, target regions of interest, and leverage Raman measurements from the identical field of view to provide and confirm the chemical identification of nanoparticles and other sample elements. **Horiba Scientific Division of Horiba Instruments Inc**, 20 Knightsbridge Rd, Piscataway, NJ 08854, www.horiba.com/scientific

Wavelength-stabilized diode laser

PhotonTec Berlin has added a high-power diode to its wavelength-stabilized product family. The new pumping source for fiber lasers and amplifiers emits up to 200 W through a 200 μm core with a fiber of numerical aperture 0.22 at 976 nm and of length 1 m or 2 m. The laser uses a volume grating to stabilize the emission wavelength at 976 nm, making it insensitive to current and to the operating temperature, up to a maximum of 45 °C. The new diode features a narrow linewidth of 1030–1100 nm and feedback protection for the fiber laser. It comes in a compact package with a thermistor and photodiode. **PhotonTec Berlin GmbH**, Max-Planck-Strasse 3, D-12489 Berlin, Germany, www.photontec-berlin.com



Fast, ultrasensitive, back-illuminated camera

Andor, an Oxford Instruments company, has expanded its Marana scientific CMOS (sCMOS) physical sciences camera platform. According to the company, the Marana 4.2B-6's low read noise and innovative UltraVac vacuum cooling make it the most sensitive back-illuminated sCMOS platform available. It features 95% quantum efficiency and vacuum cooling down to -45 °C. Because the Marana 4.2B-6 delivers up to 74 fps, it is suitable for dynamic imaging and such spectroscopic applications as wavefront sensing, quantum gas dynamics, and lucky, speckle, and hyperspectral imaging. It has a 4.2 MP array format with 6.5 μm pixels. The smaller pixel is well suited for matching the resolution of many laboratory optical imaging configurations and for high-resolution echelle spectroscopy. **Andor Technology Ltd**, 7 Millennium Way, Springvale Business Park, Belfast BT12 7AL, UK, <https://andor.oxinst.com>





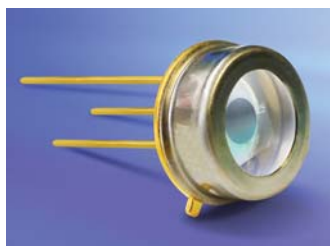
High-pulse-energy femtosecond amplifier

The Astrella HE one-box femtosecond amplifier from Coherent delivers up to 9 mJ at a repetition rate of 1 kHz. According to the company, that is the highest pulse energy commercially

available from a water-cooled, single-stage, kilohertz regenerative amplifier. The compact Astrella HE delivers beam quality of $M^2 \leq 1.25$ and comes with 35 fs or 100 fs pulse widths. It can be used to pump several tunable optical parametric amplifiers to run multiple experiments simultaneously or single experiments that need numerous independently tunable wavelengths. The company claims the Astrella HE can lower the entry barrier to applications—for example, extreme-UV generation approaching the water window or laser plasma acceleration—that to date have been enabled only by complex, costly, multibox ultrafast amplifiers. **Coherent Inc**, 5100 Patrick Henry Dr, Santa Clara, CA 95054, www.coherent.com

Short-wave-IR camera

Raptor Photonics has released the next generation of its Ninox 640 camera, which can image the wavelengths between visible and short-wave IR (SWIR). With an ultralow typical readout root-mean-square (rms) noise of $18 e^-$ and a typical dark current reading of $< 750 e^-$ at -15°C , the Ninox 640 II improves on its predecessor's noise performance. It has a superior mechanical design and is significantly more compact than the Ninox 640; according to the company, the Ninox 640 II is one of the smallest and lightest SWIR cameras available. The cooled digital camera uses a 640 pixel \times 512 pixel indium gallium arsenide sensor to perform high-sensitivity imaging from $0.4 \mu\text{m}$ to $1.7 \mu\text{m}$. The $15 \mu\text{m} \times 15 \mu\text{m}$ pixel pitch delivers high resolution, and the low readout rms noise enables the highest SWIR detection limit. Available with a 14-bit Camera Link output, the Ninox 640 II will run up to 120 Hz, which enables high-speed digital video with intelligent automated gain control. **Raptor Photonics Ltd**, Willowbank Business Park, Larne, Co Antrim BT40 2SE, Northern Ireland, www.raptorphotonics.com



Extreme-UV photodiode

Opto Diode Corp, an Illinois Tool Works company, has unveiled its SXUV5 extreme-UV (EUV) photodiode with a circular active area of 2.5 mm diameter. It has high responsivity in the 1–190 nm wavelength region and is designed to remain stable for long periods of time when exposed to high-intensity EUV energy. The SXUV5 is housed in a windowless, TO-5 package to

allow for responsivity at wavelengths shorter than 150 nm. It features a minimum shunt resistance of 20 M Ω and a reverse breakdown voltage of 5–20 V. Capacitance is 500–1500 pF, and response time is 1–2 ns. Storage and operating temperatures range from -10°C to 40°C in ambient environments and from -20°C to 80°C in nitrogen or vacuum environments. The lead soldering temperature is 260°C . **Opto Diode Corporation**, 1260 Calle Suerte, Camarillo, CA 93012, www.optodiode.com

Scientific CMOS camera for astronomy

IDEX Health & Science has launched its Finger Lakes Instrumentation (FLI) Kepler KL6060 scientific CMOS (sCMOS) camera for space debris detection and space situational awareness applications. The large-format 37.7-MP cooled camera can capture images at up to 19 fps using the optional quad small-form-factor pluggable fiber interface. The KL6060 camera is available with a high-quantum-efficiency back-illuminated sensor or with an economical front-illuminated sensor. It delivers a high-dynamic-range 16-bit image using FLI's proprietary algorithms, which ensure the end product is highly linear. The new sCMOS camera is suitable for imaging wide fields of view at high frame rates. **IDEX Health & Science LLC**, 619 Oak St, Oak Harbor, WA 98277, www.idex-hs.com



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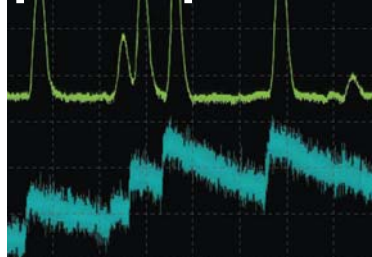
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product specifications and application notes at:

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