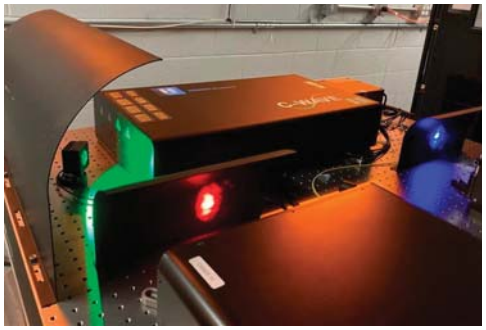
NEW PRODUCTS

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

Tunable laser for holography



Hübner Photonics and Metamaterial Inc (META) have announced the installation at META (Halifax, Canada) of Hübner's C-Wave GTR/NIR (green-to-red/near-IR) tunable laser. The new system—the first of its kind in the world, the companies say—features a broad color palette from three tunable Hübner sources. Crucially, it covers a significant gap in the green region that is costly and complex to address with alternative narrow-bandwidth lasers. With the C-Wave GTR/NIR, META will be able to record holograms at any desired wavelength across the entire visible spectrum and, therefore, potentially accelerate holographic product development. The new full-spectrum capability will allow the company to craft full-color red, green, and blue holograms at any combination of wavelengths users may require for optical combiners in augmented reality and head-up display applications. ***Hübner Photonics Inc****, 2635 N 1st St, Ste 202, San Jose, CA 95134, https://hubner-photonics.com*

Superresolution microscope for life sciences

Bruker's Vutara VXL superresolution fluorescence microscope for nanoscale biological imaging incorporates the company's single-molecule localization technology in a streamlined, cost-effective system. Designed to serve as a biological microscopy workstation for research on DNA, RNA, and proteins, the Vutara VXL also supports advanced biological and biomedical research imaging. When combined with Bruker's microscope fluidics unit, it enables multiplexed imaging for targeted proteomics research. It can also perform optical nanoscopy. The Vutara VXL offers a large field of view, high-throughput data acquisition, and multimodal capabilities. Users can obtain intrinsic 3D superresolution data and achieve 20 nm localization precision in the *xy*-direction, 50 nm in the *z*-direction for organic dyes, and even finer with DNA PAINT probes. A proprietary emission path allows the system to achieve low background fluorescence, even in thick samples. ***Bruker Nano Surfaces****, 3400 E Britannia Dr, Ste 150, Tucson, AZ 85706, www.bruker.com*

Dilution refrigerator for quantum computing

The ProteoxLX is the latest innovation in cryogen-free dilution refrigerator technology for quantum computing scale-up from Oxford Instruments NanoScience. The LX system can maximize qubit counts with its large sample space and ample coaxial wiring capacity, low-vibration features for reduced noise and support of long qubit coherence times, and full integration of signal conditioning components. Its flexible modular format makes it adaptable to various application requirements. Two fully customizable secondary inserts let users optimize the layout of cold electronics and high-capacity input and output lines. They allow full experimental setups to be installed and exchanged. The ProteoxLX delivers greater than 25 μW cooling power available at 20 mK and a low base temperature at less than 7 mK. Twin pulse tubes provide several watts of cooling capacity at 4 K. ***Oxford Instruments plc****, Tubney Woods, Abingdon OX13 5QX, UK, https://nanoscience.oxinst.com*

Crystallographic microcomputed tomography system

The Xradia CrystalCT microcomputed tomography system from Zeiss Research Microscopy Solutions enables 3D crystallographic imaging of polycrystalline materials for metal and alloy, additive manufacturing, ceramic, and pharmaceutical samples. In what the company claims is the world's first commercial implementation, the Xradia CrystalCT delivers diffraction contrast tomography on a traditional computed tomography system, which allows researchers to complement absorption contrast tomography data with crystallographic information in 3D. Seamless large-volume grain mapping increases data volume capacity compared with destructive 3D crystallographic methods. It is facilitated by advanced acquisition modes that provide stitch-free scanning for fast, accurate 3D grain data. Advanced scanning modes further remove size and acquisition-speed limitations for a wide range of common samples. ***Zeiss Research Microscopy Solutions***, *Carl-Zeiss-Promenade 10, 07745 Jena, Germany, www.zeiss.com*

Highly precise and accurate laser microscope

According to Olympus, its LEXT OLS5100 laser microscope delivers the high levels of accuracy and precision required for submicron 3D observation and surface roughness measurement, and its smart features accelerate and optimize experiment workflows for materials science applications. In three simple steps, the Smart Lens Advisor assists in the selection of the correct objective lens to measure surface roughness. The Smart Experiment Manager helps users handle the planning, acquisition, and analysis phases of their experiments. The microscope scans samples according to a software-generated customized experiment plan, which helps prevent users from missing data or having to redo work. Once users place a sample on the stage and press the start button, the microscope makes all necessary setting adjustments and acquires the data. During analysis, the software's trend visualization tools help users spot problems. ***Olympus Corporation of the Americas***, *3500 Corporate Pkwy, Center Valley, PA 18034-0610, https://olympusamerica.com*

Gas laser alternative

With its new TopWave 405 model, Toptica presents a cost-efficient alternative for the bulky, power-hungry krypton-ion-gas lasers commonly used in lithographic and holographic applications. The TopWave 405 provides 1 W output power at 405 nm and excellent beam quality. Beam diameter and M^2, which is typically 1.15, are designed to match the established gas laser parameters, which allows for easy integration without significant changes to the optical system. The higher coherence length—greater than 100 m—is well-suited for stable pattern generation in interference lithography or holography. The all-semiconductor TopWave 405 draws less than 100 W and does not require water cooling, which reduces the cost of ownership. Fully automated, push-button optimization of the optomechanics and of the output power stabilization allows for easy, hands-off, remote operation via the included graphical user interface or via users' control software. ***Toptica Photonics Inc***, *5847 County Rd 41, Farmington, NY 14425, www.toptica.com*

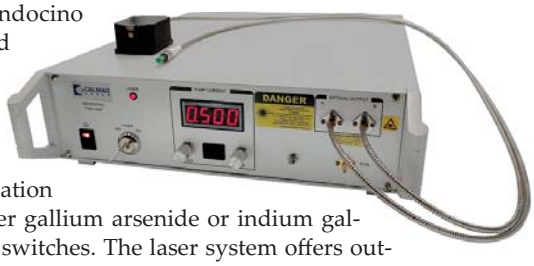
Interband cascade lasers

Boston Electronics now offers broad-gain interband cascade laser (ICL) chips from Alpes Lasers (St-Blaise, Switzerland). Developed for use in external cavity systems, the ICLs allow emission at shorter wavelengths than do traditional quantum cascade lasers, which is particularly relevant to hydrocarbon detection. The chip initially offered by the company covers the 3.2–3.6 μm (2820–3070 cm^{-1}) range, which contains absorption lines mainly for formaldehyde, as well as for methane, ethane, and hydrogen chloride. The ICLs deliver optical power up to 10 mW. ***Boston Electronics Corporation***, *91 Boylston St, Brookline, MA 02445, www.boselec.com*

Scientific SWIR camera

With a 640 pixel × 512 pixel sensor and 15 µm × 15 µm pixel size, the Ninox 640 SU from Raptor Photonics offers very high spatial resolution. According to the company, the indium gallium arsenide camera offers an ultralow dark current reading of less than 300 e/p/s at −80 °C and read noise of less than 56 e^- in high gain, which makes it one of the most sensitive scientific shortwave IR (SWIR) cameras currently available and appropriate for imaging weak signals using longer exposure times. It is vacuum cooled to −80 °C for ultralong exposures of up to 5 min. To enable simultaneous capture of bright and dark portions of a scene, the camera also offers a wide intrascene dynamic range of 56 dB in high gain. The Ninox 640 SU is suitable for staring applications in SWIR wavelengths (900–1700 nm), including near-IR II *in vivo* imaging, fluorescence imaging, and astronomy. ***Raptor Photonics Ltd**, Willowbank Business Park, Larne, Co Antrim BT40 2SF, Northern Ireland, UK, www.raptorphotonics.com*

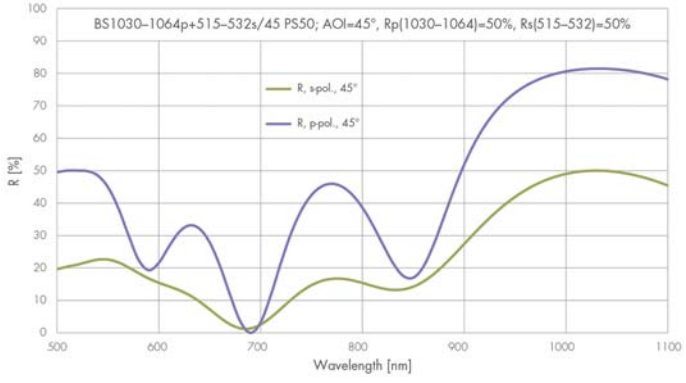
Laser for terahertz-radiation generation



Calmar has expanded its Mendocino benchtop family of femtosecond fiber lasers by adding a dual-wavelength 780/1550 nm system designed for researchers in the terahertz-radiation field. It is a suitable source for the generation of terahertz radiation with either gallium arsenide or indium gallium arsenide photoconductive switches. The laser system offers output power levels up to 200 mW. It features convenient armored-fiber-cable beam delivery, a simple optical switch to select the required wavelength, and user-friendly front-panel controls. With Calmar's proprietary saturable absorber technology, the system delivers reproducible mode-locking with high stability and reliability soon after the laser is turned on. ***Calmar Laser**, 951 Commercial St, Palo Alto, CA 94303, http://calmarlaser.com*

Ultracompact UV nanosecond lasers

The latest entry in the Spectra-Physics Explorer One HP line of ultracompact actively Q-switched lasers from MKS Instruments delivers 3.5 times as much pulse energy as existing models. The Explorer One HP HE 355-200 UV laser offers pulse energies of greater than 200 µJ, pulse widths of less than 15 ns, and average power of greater than 4 W. User-adjustable repetition rates range from single shot to 200 kHz. For optimal process control, the E-Track active pulse-energy control features a closed-loop algorithm that enables dynamic pulse-energy adjustment with various gating operations. A single lightweight package houses the electronics and laser cavity, which facilitates fast, straightforward integration into compact tools and desktop instruments. The high-energy laser is suitable for precision industrial-manufacturing applications such as structuring and ablating thin films in displays and photovoltaics and trimming of microresistors and capacitors. ***MKS Instruments Inc**, 2 Tech Dr, Ste 201, Andover, MA 01810, www.mksinst.com*



Two-wavelength and polarization beam splitter

Laser Components has developed a beam splitter in which the combined beam of a frequency-doubled laser is divided such that 50% of each of the two wavelengths is split off, even if the beams have different polarizations. The polarization remains the same for both beams. Previously, a beam splitter and a retardation plate were required for that process. The company has been able to combine both functions into one optic, which significantly accelerates setup and maintenance. The original design is for 1030 nm and 515 nm incident beams. However, wavelengths, polarization, and the reflection/transmission ratio can be individually adapted depending on the application. ***Laser Components USA Inc**, 116 S River Rd, Bldg C, Bedford, NH 03110, www.lasercomponents.com*

Compact SWIR camera for quality control

New Imaging Technologies has launched a line of shortwave IR (SWIR) indium gallium arsenide cameras. The LiSaSWIR is optimized for applications that require short exposure times and high-accuracy line rates. According to the company, the line-scan array camera delivers high SWIR image quality while maintaining cost and integration advantages in quality-control systems. The SWIR spectrum simplifies obtaining more invisible data during real-time monitoring. The first version available is the light, compact LiSaSWIR 2048M-STE with 2048 pixels × 1 pixel at a 7.5 μm pitch, a speed of 60 kHz at full line, and a readout noise of 250 e^- in high gain. It features bad pixels replacement, embedded nonuniformity correction, and CameraLink interface. Applications include the inspection of semiconductor, wafer, and solar cell panels. ***New Imaging Technologies***, *1 Impasse de la Noisette, 91370 Verrières-Le-Buisson, France, https://new-imaging-technologies.com*

Wavelength-tunable picosecond laser

EKSPLA's PT403 series tunable picosecond laser, which integrates a diode-pumped solid-state laser and an optical parametric oscillator into a single housing, provides 210–2300 nm output from one box. Compared with two-box systems, the PT403 has a footprint almost half the size, a shorter installation time, better stability, and other benefits. The optical design is optimized to produce low-divergence beams with moderate linewidth—typically less than 8 cm^{-1}—at approximately 15–20 ps of pulse duration. Featuring a 1 kHz repetition rate, the PT403 tunable laser is a versatile, cost-effective tool for scientists in such disciplines as time-resolved fluorescence, pump–probe spectroscopy, laser-induced fluorescence, and IR spectroscopy. ***EKSPLA***, *Savanoriu Ave 237, LT-02300 Vilnius, Lithuania, https://ekspla.com*

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