New Products

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. To facilitate inquiries about a particular product, a Reader Service Card is attached inside the back cover of the magazine.

Lawrence G. Rubin

Focus on Lasers and Optics

Industrial Excimer Laser

TuiLaser has optimized the ExciStar S-Industrial series of high-repetition rate, UV, excimer laser sources. The company has paid particular attention to safety concerns with the handling of halogen gases. The discharge tube is constructed from metal and ceramic components and is supported by a reengineered gas management system. A newly designed vacuum pump works with a halogen exhaust filter to ensure that no halogen leaks into the environment. The lasers incorporate a corona preionization technique that does not use ionizing pins and operates with a solid-state switch to produce a "soft" discharge. Different versions of the ExciStar S-Industrial are available with repetition rates of 200, 500, or 1000 Hz and wavelengths of 157, 193, 248, 308, or 351 nm. The series reaches its maximum energy of 18 mJ at 248 nm. *TuiLaser AG, Industriestrasse 15, 82110 Germering/Munich, Germany, http://www.tuilaser.com*

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Widely Tunable Ultrafast Laser

Coherent has developed the Chameleon-XR, an ultrafast laser that extends the tuning range of the company's Chameleon laser to 260 nm (720–980 nm). Designed for multiphoton excitation (MPE) microscopy, both the Chameleon and Chameleon-XR provide widely tunable femtosecond pulses with more than 1 W of average power. Both models have a pulse width optimized for minimal broadening in most microscope systems and can excite all the fluorophores commonly used in MPE. The longer wavelengths of the Chameleon-XR enhance excitation of several important fluorescent proteins and reduce cell photobleaching. Both models feature the company's Power Pulse system, which uses a dispersion-balanced tuning mechanism to ensure that output power and pulse width are optimized automatically at all wavelengths. *Coherent Inc, 5100 Patrick Henry Drive, Santa Clara, CA 95054 http://www.coherent.com*

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Blue Laser for Raman Spectroscopy

Melles Griot has introduced the single-frequency 85 BCA laser series that operates in the blue spectral

region at 473 nm. This series of diode-pumped solid-state (DPSS) lasers was designed for OEM applications in high-resolution Raman spectroscopy but makes an ideal choice for scanning, measurement, and interferometric applications. The blue DPSS lasers feature a single longitudinal mode, excellent beam quality, and an output noise of less than 2% peak to peak. The 85 BCA series is available with output powers of 5, 10, or 15 mW and a linearly polarized, nearly circular (less than 1.1:1 aspect ratio) beam. The lasers provide a wavelength and beam diameter that are closely matched to that of blue argon-ion lasers, making them reliable drop-in replacements. *Melles Griot, Laser Group, 2051 Palomar Airport Road, 200, Carlsbad, CA 92009, http://www.mellesgriot.com*

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Beam Delivery System

The new Microtech modular, tabletop, UV-laser beam delivery (MBD) and

microscope camera system from JPSA Laser is designed to mount on a standard optical breadboard. The MBD system features high-precision optomechanics for exact repeatability, on-target process viewing with a zoom to 180× on screen, continuously variable demagnification from 4× to 20× and 1-μm resolution. A variable laser-fluence fine adjustment enables the finesse required for high-precision tasks. The base system includes an on-target camera, a variable attenuator, z-axis crossed-roller stage with coarse- and fine-focusing adjustment, and a doublet objective for better than 5-μm on-axis spots. The base system can adapt to up to three different lasers with only a simple mirror change routine. A wide range of options is available with the MBD system. *JPSA Laser, 17D Clinton Drive, Hollis, NH 03049, http://www.jpsalaser.com*

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Tunable Diode Laser

Toptica Photonics has released the DLX 110, a diode laser system that features more than 400-mW output power, single-frequency and single-spatial mode emission at the standard center wavelengths of 766, 780, 795, and 850 nm. Mode-hop-free fine tuning of more than 30 GHz is accomplished by an internal piezoelectric drive. On request, the factory-preset wavelength can be tuned to any wavelength in the range of ±6 nm with respect to the center wavelength; no beam walk is associated with this tuning. Ideal for high-resolution spectroscopy, the DXL 110 is supplied with an internal output isolator (35 dB), a probe beam output, and a high-frequency modulation input. It can be equipped with a single-mode fiber coupling mounted as an add-on at the beam exit of the laser head. *Toptica Photonics AG, Fraunhoferstrasse 14, D-82152 Martinsried/Munich, Germany, http://www.toptica.com*

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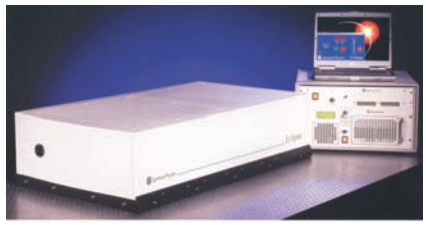
Femtosecond Laser Amplifier

The Eclipse from Spectra-Physics is a high-power femtosecond amplified laser system based on ytterbium tungstate (Yb:KGW). The new amplifier is said to offer many advantages compared to titanium:sapphire systems, primarily due to the greater simplicity and reliability offered by direct diode pumping. The Eclipse provides an output power up to 4 W at 1048 nm, operates at pulse repetition rates up to 7 kHz, and generates pulse widths of less than 500 fs. Equipped with an optional frequency-doubler module, the Eclipse delivers an output power of up to 1.5 W in the green wavelength range at 524 nm—ideal for pumping optical parametric amplifiers. The compact laser head incorporates two diode-pumped modules, the sealed mode-locked oscillator, and the regenerative amplifier. *Spectra-Physics Inc, 1335 Terra Bella Avenue, P.O. Box 7013, Mountain View, CA 94039, http://www.spectra-physics.com*



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Lasers for Flow Visualization

New Wave Research has announced the Solo IV, the latest in its line of laser systems for particle image velocimetry applications. Designed for fluid and airflow visualization, the new laser features a twin laser head that produces high repetition rates and enables users to capture more data sets during studies of flow phenomena. Each of the laser heads can produce a 50-mJ pulse of 532-nm light at a repetition rate of 50 Hz; with both laser heads firing, the rate can be doubled to 100 Hz. The Solo IV is a Q-switched neodymium:YAG laser system whose two heads are driven by a single power supply. It also features multiple triggering options. Capable of being fired from the front panel or from an external source, the Solo IV's Q-switch activation can also be controlled internally or externally. *New Wave Research Inc, 47613 Warm Springs Boulevard, Fremont, CA 94539, http://www.new-wave.com*

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Compact Ultrafast Source

Quantronix has introduced the Integra-C, a compact version of the company's Integra high-energy femtosecond source. The entire system, including a monolithic fiber oscillator, stretcher, regenerative and multipass amplifier stages, compressor, and pump laser, is contained within a single housing. The Integra-C, an oscillator-to-output system, can supply at a center wavelength of 785 nm, ±10 nm, more than 2.5 mJ in pulses that are less than 100 fs. Thermal stabilization and "zero-drift" optical component mounts result in a ±5°C operating range. The Integra-C is pumped by the company's Darwin series of diode-pumped, frequency-doubled neodymium:YLF green lasers. The new source is ideal for initiating and observing ultrafast time-resolved phenomena, vibrational spectroscopy, terahertz imaging and remote sensing, and as a pump for tunable parametric devices. *Quantronix Corporation, 41 Research Way, East Setauket, NY 11733, http://www.quantronixlasers.com*

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Laser-Induced Breakdown Spectrometer

The Ocean Optics LIBS2000+ Laser-induced Breakdown Spectrometer is an instrument that allows for broadband spectral analysis from 200 to 980 nm, with a resolution of approximately 0.1 nm. Operation involves a high-intensity neodymium:YAG pulsed laser beam—the laser can be supplied by the company or by the user—that is focused on the sample area, followed by a single, 10-ns pulse that excites the sample and generates a plasma. As the plasma decays or cools, excited atoms in the plasma emit light of wavelengths that are distinct to each element in the sample. The detection system uses seven of the company's HR2000 miniature fiberoptic spectrometers, each with a 2048-element linear CCD array. All the spectrometers are triggered to acquire and read out data simultaneously. *Ocean Optics Inc, 830 Douglas Avenue, Dunedin, FL 34698, http://www.oceanoptics.com*

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Tunable Laser Diode Source

OZ Optics has released its tunable laser diode source, a compact optical

source that provides a user-controllable wavelength and output power level. Due to its unique temperature compensation system, the source can maintain high accuracy over a wide range of ambient temperatures. With wavelength accuracy at the picometer level, the OZ tunable source is able to meet the demanding requirements of dense wavelength-division multiplexing applications. The instrument features power level control and stability to better than 1% over a wide range of temperatures and wavelengths. The tunable laser diode source is available with center wavelengths over the range 400– 2000 nm and has a tuning range of ±2 up to ±5 nm and a power output from the milliwatt level to as high as several hundred milliwatts. *OZ Optics Ltd, 219 Westbrook Road, Carp, Ontario K0A 1L0, Canada, http://www.ozoptics.com*

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Diode Laser Array

The SPL LG81 from OSRAM Opto Semiconductors is a new high-power diode laser array in a sealed, robust package with fast axis collimation and a semi-external microchannel cooler that can be operated at temperatures ranging from 10 to 30°C. It has an optical output of 30 watts CW at a wavelength of 808 nm and a spectral bandwidth of 4 nm, and is designed for both CW and pulsed operation. The SPL LG81 incorporates single-quantum-well laser diodes that exhibit superior electro-optical and thermal-mechanical properties. The laser array reportedly features a laser threshold up to 25% lower and a 15% increase in operating efficiency relative to conventional laser diodes. The SPL LG81 is designed for OEM applications and is available as an application kit. *OSRAM Opto Semiconductors, 3870 North First Street, San Jose, CA 95134, http://www.osram-os.com*

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Laser Spectral Analyzer

The SA^{Plus} from EXFO is a laser spectrum analyzer for measuring the line width, longitudinal mode structure, and frequency stability of narrow-band lasers. The analyzer uses a piezoelectrically scanned, confocal mirror, Fabry–Perot interferometer to provide the finesse necessary for high-resolution measurements. For wavelengths greater than 1000 nm, the finesse is more than 300; at shorter wavelengths, a finesse greater than 200 can be expected. The SA^{Plus} incorporates interchangeable mirror sets for operation in a wavelength range of 250 nm selected anywhere between 450 nm and 1.8 μm. The free spectral range of the SA^{Plus} can be configured for either 2 or 8 GHz for optimal resolution. Optional fiberoptic coupling is available. *EXFO Burleigh Products Group Inc, 7647 Main Street Fishers, Victor, NY 14564-8909, http://www.exfo.com*

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Interferometer

The INTERFIRE-II interferometer has been announced by Precision Optical Engineering. Available with a choice of lasers operating at 10.6 μm wavelength, tunable over the 9.2- to 10.7-μm waveband, or in the 3- to 5 μm waveband range. The new instrument allows fringes to be obtained more quickly and with improved signal-to-noise ratio. For improved stability, the new laser used in the INTERFIRE-II 3–5 is mounted on an invar frame, that, when combined with a

fast warm-up time, results in the production of fringe images with no drifting of laser mode that would otherwise reduce fringe modulation. A focal-plane array camera is used in the new interferometer and, when coupled with phase-shifting analysis software, enables more reliable acquisition of fringes. *Precision Optical Engineering, 42 Wilbury Way, Hitchin Hertfordshire SG4 0TP, UK, http://www.p-oe.co.uk*

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Fused Silica Lenses

Newport has introduced four new series of fused silica lenses that feature low-scatter, precision surfaces suitable for applications in the UV, visible, and NIR. The combination of low-absorption fused-silica substrates, 20-10 scratch-and-dig surface quality, and high-quality coatings enable these optics to work with laser power levels as high as 3 J/cm^2 (10-ns pulses) at 1064 nm. The lenses are specified with a surface irregularity of less than $\lambda/8$ and a focal length tolerance of 1%. Four different lens types are offered: Plano-convex lenses have diameters of 6.35, 12.7, 25.4, and 50.8 mm and focal lengths ranging from 12.7 to 500 mm. Bi-convex lenses are available in the same diameters, in focal lengths from 12.7 to 1000 mm. Plano-concave and bi-concave lenses are also available. *Newport Corporation, 1791 Deere Avenue, Irvine, CA 92606, http://www.newport.com*

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Wavelength Measurement and Control

Precision Photonics has released the TLSA1000 Tunable Laser Spectrum Analyzer designed for applications such as interrogation of optical fiber sensors and optical component characterization. Used with the appropriate sensors, the TLSA1000 resolves changes in temperature and pressure to better than ±0.01°C and ± 0.1 psi, respectively. The spectrum analyzer combines a laser source, receivers, subpicometer wavelength calibration, and realtime data analysis into one box (see photo). It can resolve 0.01-pm wavelength shifts and can provide an absolute wavelength accuracy of better than 0.4 pm with NIST traceability. The TLSA1000 operates in the wavelength range 1520–1620 nm and offers a wavelength scan speed of 1–150 nm/s. *Precision Photonics Corporation, 2901 55th Street, Boulder, CO 80301, http://precisionphotonics.com*

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New Literature

Lake Shore Cryotronics has published its 2004 *Temperature Measurement and Control Catalog*. The catalog includes selection guides to help users more easily choose appropriate cryogenic sensor, instrument, and accessory solutions. *Lake Shore Cryotronics Inc, 575 McCorkle Boulevard, Westerville, OH 43082 http://www.lakeshore.com* ■

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