

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

Diode Laser Systems

CUBE Lasers from Coherent are compact, diode laser systems, intended for OEM and stand-alone operation. These lasers, combining both the laser head and electronics in a single package, are available at five wavelengths from the UV through the near-IR: 375, 405, 440, 635, and 785 nm. Depending on wavelength, output powers are as high as 50 mW. CUBE lasers can be operated from CW up to a pulse repetition rate of 150 MHz, and their function and status can be controlled by any of three separate connections, which support analog, digital RS-232, and plug-and-play USB control. The connectivity software uses a standard Microsoft Windows platform and a virtual control panel for display and control of all laser parameters. The laser has a built-in photodiode that measures the laser output power and can provide closed-loop power stability. *Coherent Inc., 5100 Patrick Henry Drive, Santa Clara, CA 95054, <http://www.coherent.com>*

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Fiber-Coupled Lasers

Thorlabs has announced a new family of fiber-coupled femtosecond lasers. The passive mode-locked lasers of the FSL1010 series provide pulse lengths of less than 150 fs, a center wavelength of 1550 nm, and a fixed repetition rate of 80 MHz with 1 ppm stability. (Any fixed rate between 50 and 100 MHz is available on request.) Thorlabs offers models with average output powers of 10 mW or 150 mW and expects that frequency-doubled output—780 nm—will soon be available. The large optical bandwidth (greater than 30 nm) of the FSL1010 makes it ideally suited for amplifier seeding and subsequent pulse compression. A software routine is used on power-up to automatically identify, and then lock to, the optimal mode-locking state that provides the best stability and shortest pulse width. *Thorlabs Inc., 435 Route 206*

North, Newton, NJ 07860, <http://www.thorlabs.com>

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Diode Laser for Teaching

TeachSpin has introduced diode laser spectroscopy for exploring atomic physics with a tunable laser. The centerpiece of the apparatus is the grating-stabilized 780-nm diode laser (see photo). Included is a controller, di-



vided into modules that the student must interconnect. Within the modules, students can control the laser current and temperature, the temperature of a rubidium vapor cell, and a ramp generator for modulation. Students can investigate phenomena such as the energy states of both isotopes of rubidium (^{85}Rb and ^{87}Rb), the relationship between resonant atomic absorption and refractive index in Rb vapor, the operation and characteristics of stabilized diode lasers, and interferometric methods of calibrating the frequency sweep of a laser. *TeachSpin Inc., 2495 Main Street, Suite 409, Buffalo, NY 14214-2153, <http://www.teachspin.com>*

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Pulsed Dye Laser

Lambda Physik's ScanMatePro pulsed dye laser series delivers narrow linewidth and high spectral pu-

rity over a tuning range of 320–860 nm. Plug-in, bandwidth-reduction optics allow continuous scanning at a linewidth of less than 0.08 cm^{-1} across the entire tuning range of any dye. ScanMatePro is also available with improved automated etalon scanning that enables hands-free wavelength scanning at 0.03 cm^{-1} . This updated dye laser features an amplified spontaneous emission of less than 0.5% of the total output intensity. The new laser is said to be the only pulsed laser that can be optimally configured for pumping by either a neodymium:YAG laser or an excimer laser. The ScanMatePro C is a compact system with a built-in Nd:YAG pump laser rigidly mounted in the back of the three-rod system. *Lambda Physik USA Inc., 3201 West Commercial Boulevard, Ft. Lauderdale, FL 33309, <http://www.lambda Physik.com>*

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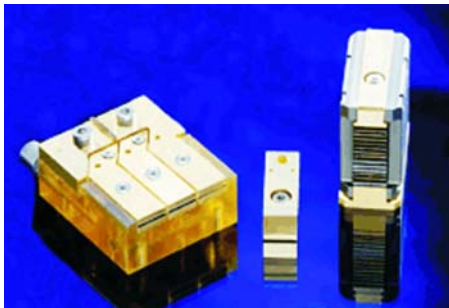
Pump Laser Module

The Bookham company is offering the LC96 series, a new 980-nm pump laser module that combines a kink-free power output of up to 580 mW with high reliability and stable performance. The new modules reportedly allow a significant step forward in the design and operation of erbium-doped fiber amplifiers (EDFAs) by enabling lower power dissipation, extended operating ranges, and improved noise figures. The LC96 series is expected to be the most powerful of its kind for telecommunications applications. It should allow EDFA designers to replace 1480-nm pump lasers with 980-nm pumps and thus reduce the number of pumps required. The new pump module incorporates the latest G08 laser chip from the Bookham facility in Zurich, Switzerland, in a hermetically sealed, 14-pin cooled butterfly package. *Bookham Inc., 2584 Junction Avenue, San Jose, CA 95134, <http://www.bookham.com>*

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Diode Laser Array

The 100-W Cascades diode laser array has been released by nLight. The new product is a water-cooled array that provides 100 W of CW output power in the wavelength range from 790 to 980 nm and 20 W of CW power from 1435 to 1570 nm. The 1-cm-wide microchannel device can be configured either horizontally or vertically, with a maximum of 20 bars high or 6 bars across. The arrays are based on the company's metal-organic-chemical-vapor-deposition-grown laser structure, which has demonstrated more



than 364 W of CW power from a single 1-cm bar; the 100-W Cascades product line has an 80% fill-factor bar. The typical drive current to achieve 100 W output at room temperature is 115 A with a compliance voltage of 1.85 V. Collimation optics and internal lensing can reduce divergence in the fast and slow axes to less than 0.5° and 3°, respectively. The spectral width is less than 3.0 nm. *nLight, 5408 NE 88th Street, Building E, Vancouver, WA 98665, <http://www.nlight.net>*

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Q-Switched Green Lasers

Photonics Industries' DM series of diode-pumped neodymium:YLF Q-switched green lasers now includes the DM50-527, with 50 mJ per pulse at 1 kHz repetition rate with a wavelength of 527 nm. The company uses its proprietary pump design and intracavity harmonic generation technologies to reportedly offer the highest-efficiency, highest-pulse energy at kilohertz pulse rates in diode pumped systems commercially available. The low thermal lensing effect and natural birefringence of Nd:YLF lasers are said to result in more stable pulse energy and average power when compared with Nd:YAG-based green lasers. Optional features include an automated power attenuator, fiber-coupled output, TEM₀₀ output, and

twin pulse operation (separation of 1 μ s and greater). *Photonics Industries International Inc, 390 Central Avenue, Bohemia, NY 11716, <http://www.photonix.com>*

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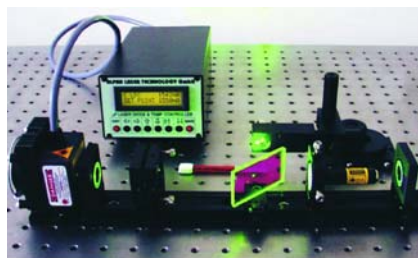
Regenerative Amplifier Systems

The Austrian company High Q Laser has extended the pulse repetition rate of its picoREGEN series from 100 kHz up to 500 kHz, which scales up the material throughput in micro-processing. These picosecond regenerative amplifier systems offer output pulse energies up to 3 mJ at pulse durations of 10 ps, up to 10 W average power, and at a wavelength of 1.064 μ m in a compact, modular, sealed-off system. The company has integrated on one thermally stabilized base platform a seed laser module, a regenerative amplifier module, and other optional modules such as a post-amplifier, frequency conversion, and pulse-picking. The picoREGEN series is based on direct diode pumping realized with user-replaceable diode modules and semiconductor, saturable-absorber mirror modelocking. *High Q Laser (US) Inc, 118 Waltham Street, Watertown, MA 02472, <http://www.highq-us.com>*

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DPSS Laser Kit

A diode-pumped solid-state laser kit from Alphasas offers five different modes of operation and is aimed primarily at education in laser theory and practice. The five modes are IR-CW and Q-switched at 1064 nm, green intracavity frequency-doubled CW and Q-switched at 532 nm, and external frequency doubling of the Q-switched pulses. In addition to all necessary laser components and the laser diode driver, the kit also includes devices for analyzing the laser parameters, such as a 300-ps photodetector, a CCD array, and an IR-to-visible converter. Other options are available, including active Q-switching, a microchip laser, and harmonic generation. It is expected that users can adapt the



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laser kit to existing laboratory training and create their own experiments. *Alphas GmbH, Bertha-von-Suttner-Strasse 5, D-37085, Goettingen, Germany, <http://www.alphas.com>*

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Compact Excimer Laser

TuiLaser has introduced the Xantos S, a compact excimer laser with an integrated gas supply, reportedly the first commercial excimer laser that incorporates an entire gas handling system. The Xantos S is based on the company's technologies of corona preionization and the latest generation of solid-state compression switches to produce a very homogeneous pumping discharge. This results in best beam quality and high pulse-to-pulse stability, together with a soft discharge that reduces abrasion and leads to a significantly lower fault liability. The new laser reaches a maximum energy up to 18 mJ at 248 nm and features an energy stability of better than 2% standard deviation. There are different versions that vary in maximum repetition rate (200 or 500 Hz) and wavelength (192 or 248 nm). *TuiLaser AG, Industriestrasse 15, 82110 Germering, Munich, Germany, <http://www.tuilaser.com>*

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Laser Diode Array

Osram Opto Semiconductors has announced the Sirilas SPL LG81, a laser diode array designed for solid-state pumping, material processing, illumination, and industrial applications. The Sirilas modules contain a laser bar comprising 16 individual emitters, said to enable a 20% smaller package than current standard solutions. The device incorporates a specially tailored heat sink: Integrated cooling fins on which the laser is centered provide effective water cooling that reduces the possibility of corrosion. An integrated lens produces an almost parallel beam with vertical divergence of less than one degree. The modular concept of the laser design allows other wavelengths to be used. In contrast to conventional laser stacks, the new laser diode source can be replaced individually, as necessary. *Osram Opto Semiconductors Inc, 3870 North First Street, San Jose, CA 95134, <http://www.osram-os.com>*

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Particle Image Velocimetry Systems

Oxford Lasers has launched its new VisiVector E particle image velocimetry systems, which exploit a breakthrough in laser technology applied to PIV. With speeds of 12 to 5000 frames per second, the new high-speed instrument enables users to study transient or nonreproducible events. The VisiVector E systems are particularly useful for liquid flow studies such as blood flows, two-phase flows, supercritical fluids, and flow visualization. For airflow studies, Oxford Lasers supplies seeding generators that allow the introduction of low-density, hollow microspheres into the air stream. The VisiVector product line includes 2D/planar and stereo/3D systems and high-speed/time-resolved and microPIV systems for microfluidics applications. *Oxford Lasers Inc, Imaging Division, 29 King Street, Littleton, MA 01460-1528, <http://www.oxfordlasers.com>*

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Semiconductor Optical Amplifier

The Centre for Integrated Photonics has developed the SOA-NL-OEC-1550, a semiconductor optical amplifier that offers optimized nonlinear operating characteristics. The new SOA has a saturated gain recovery time of less than 25 ps at 40 gigabits/s transmission speed. It also provides large-spot interfaces with ultralow reflectivity that allow it to be passively aligned when used in integrated optical subsystems. Operating at a wavelength of 1550 nm, the indium phosphide, multiple-quantum-well SOA device features a polarization-dependent saturated gain of less than 0.5 dB, a high gain figure of more than 30 dB for small signal inputs, and an internal active waveguide with a high confinement factor of more than 20%. *Centre for Integrated Photonics Ltd, B55 Adastral Park, Martlesham Heath, Ipswich, IP5 3RE, UK, <http://www.ciphotonics.com>*

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Power and Energy Meter

The MPE-2500 from Spiricon Power Products is a portable, dual-channel power and energy meter for measuring lasers and other optical sources. The meter provides data logging and export, onboard statistical analysis, and analog and digital outputs; it presents both channels simultaneously in either analog or digital dis-



play on a high-resolution backlit LCD screen. In conjunction with the MPE-2500, the company offers a broad selection of 55 probes that are operational in a variety of modes. There are 36 thermopile models, including a 600-W air-cooled version; 15 pyroelectric probes that feature 12-, 25-, 50-, 75-, and 100-mm-diameter receptors with various receptor coatings; and semiconductor probes for UV, visible, and near-IR applications. *Spiricon Power Products Inc, 60 West 1000 North, Logan, UT 84321, <http://www.spiriconpower.com>*

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Fiber Coupler for Laser Systems

Toptica Photonics' FiberDock, a fiber coupler designed specifically for the company's range of lasers, is also useful with other lasers. The FiberDock allows all required degrees of freedom for maximum coupling efficiency—up to 85% with SM fibers and PM-SM fibers and 90% with MM fibers. Special attention was paid to achieving independence of the alignment axes, so that cross-talk is virtually eliminated and hysteresis significantly reduced. Once aligned, all axes can be individually locked to require minimal correction of alignment during locking. Based on the individual laser parameters, such as wavelength (from 350 to 2000 nm) and beam diameter up to 6 mm, a suitable focusing lens can be selected and installed. *Toptica Photonics Inc, 94 North Elm Street, Suite 101, Westfield, MA 01085, <http://www.toptica-usa.com>*

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New Literature

Ophir Optronics has published its new, 128-page 2005 *Laser Measurement Instruments* catalog that includes a CD. The new catalog includes information on Ophir's photodiode, thermal, pyroelectric, repetitive-pulse, and OEM measurement heads: beam profilers; a beam analyzer; and wavelength and temporal profiling systems. *Ophir Optronics Inc, 260-A Fordham Road, Wilmington, MA 01887, <http://www.ophiropt.com>*

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