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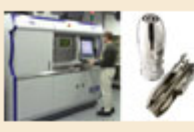
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Highlights from the **September 2013** issue of Photonics Spectra



Photonics Helps Create Greener Airways
 Lasers and imaging systems are helping build lighter, more fuel-efficient aircraft that comply with future regulatory goals. White contrails in the sky could soon be tinged green, thanks to increased airplane efficiency brought about by manufacturing using lasers and imaging systems. Lasers are taking weight out of components and ramping up performance, thereby boosting fuel efficiency and cutting carbon emissions; imaging systems are ensuring complicated airfoils are correctly made, raising engine efficiency.

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Plastics Additives Allow Inkless Marking
 High-quality, cost-effective laser writing on plastic parts means choosing the right additive and the best laser for the job. Thanks to lasers, manufacturers can write characters and images on any plastic parts you can think of, no matter the shape or surface structure. Expiration dates on bottle closures, serial numbers on technical parts, or marking items with an ID number or even indestructible bar codes - it's all possible with materials advances and lasers.

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Active Pulse Management Enables Femtosecond Athermal Ablation
 Managing pulse-width variability in the athermal regime calls for integrated sensors, actuators and embedded software. In extremely short pulses, generally in the several-hundred-femtosecond regime, light interacts with matter fundamentally differently from the way other forms of energy do. This interaction allows micron-resolution features to be machined in virtually any material without introducing excess heat to the target. But pulse stability at femtosecond speeds has been difficult to maintain. Combining athermal ablation with active pulse management enables unprecedented precision for industrial applications.

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Raman Overcomes Challenges for Industry
 Raman spectroscopy is becoming increasingly prevalent in commercial applications. Challenges include making remote measurements of chemical species in high-pressure or high-temperature environments while customers demand compact instrumentation with ever-greater sensitivity. These obstacles require new approaches such as fiber-coupled spectrometers with greater throughput.

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Better Materials Mean Better Solar Cells
 Crystalline silicon, or c-Si, is the dominant photon-absorbing material in conventional solar cell technology; it made up nearly 90 percent of the modules produced globally in 2012. Although no other material comes close to replacing plentiful, inexpensive c-Si - thin film is a distant second - the technology still isn't cheap enough in most global markets to justify replacement of conventional electricity sources. As an energy source, c-Si may be greener and safer than coal or nuclear power, but until solar reaches widespread grid parity - the point at which the levelized cost of the electricity it generates is equivalent to that of the existing conventional electricity grid - researchers must continue to improve existing technology.

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LEDs Offer a Lighting Makeover
 The venerable lightbulb is going high-tech, thanks to LEDs: Light-emitting diode products are more efficient, longer-lived and more versatile than incandescent and fluorescent lighting. But solid-state lighting is more expensive. Fortunately, ongoing innovations in LED semiconductors, substrates, phosphors and other materials - combined with volume manufacturing - are cutting costs, changing the value calculation in the \$100 billion worldwide illumination market.

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Products from this Issue




Extremely Compact High Speed Camera
 AOS Technologies AG
 The Q-MIZE is a compact, high speed, high resolution camera for application under harsh environmental conditions. The light sensitive sensor combined with a sophisticated image quality algorithm embedded in the camera provides crisp clear images.

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T165 Laser Pulser
 Highland Technology, Inc.
 The T165 Laser Pulser incorporates an edge triggered pulse generator with 150 picoseconds nominal rise and fall times into a butterfly packaged laser. The 2" by 2" design connects directly to Type 1, 0.1" pin-pitch, butterfly laser packages, making it ideal for OEM use in laser systems.

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CW Laser Series
 Spectra-Physics, Division of Newport Corp.
 Spectra-Physics, a Newport Corp. brand, has extended the Excelsior One CW laser series with the release of three new wavelengths: 515, 553 and 594 nm. The expanded series of 14 diode-pumped solid-state and direct-diode lasers is suitable for a variety of fluorescence-based bioinstrumentation applications, including flow cytometry, confocal microscopy and DNA sequencing.


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2-D Piezo Scan/Positioning Stage
 piezosystem jena GmbH
 The Scan XY40 piezoelectric actuating stage from piezosystem jena offers a travel range of 40 µm per axis and is suitable for 2-D scanning applications as well as applications that require low settling times, including semiconductor, electronics, measurement, quality assurance and microbiology.

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