

OPTOELECTRONICS

▲ R E P O R T ®

including Laser Report

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From the Editors

Optoelectronics is the technology of systems and devices that emit, modulate, transmit, or sense light. Optoelectronic devices include lasers and other light sources, optics, fiberoptic components, detectors, displays, and imaging devices.

Optoelectronics Report, now incorporating Laser Report, covers both national and international business news and market trends and tracks technology advances to interpret their business implications.

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Optical fiber sensing seeks broader markets

CALABASAS, CA—The ongoing transition from electrical cable to optical fiber technology for sensing applications is driven by many advantages, with freedom from electromagnetic interference (EMI) among the most predominant for many application areas. The cost of the optical components, particularly the laser sources, however, has presented one of the primary impediments to market growth for optical technology, according to André de Fusco, president and CEO of Sabeus. de Fusco expects the tipping point for laser prices to arrive sometime next year, however.

He likened the current situation of laser technology for sensing applications to the historical situation of digital sub-

scriber line (DSL) technology for high speed data communication. The technology had been around for decades but didn't make an impact on the market until it could be produced economically. A key problem in producing laser technology for the sensing market is the market itself, which is actually a loose collection of relatively small and diverse markets that are not homogeneous enough to enable a provider to build the economies of scale that might bring prices down.

Sabeus leapt from the collapsing telecom bubble into the sensing market in 2000 with its laser technology and an intention of becoming more than just one
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Honda invests in 3-D sensor-maker Canesta

SUNNYVALE, CA—According to Canesta, a leading developer of electronic-perception technology, Honda Motor Co. has made multiple investments in the company over the past three years—to the tune of more than \$5 million—to assist in the development of new automotive-safety applications based upon its 3-D sensor technology.

According to Toshihori Arita, head of Honda Strategic Venturing, a corporate venture arm of Honda Motor Co., Canesta's sensors, which can be concealed in the bodywork, trim, or cockpit of consumer vehicles, may provide an attractive alternative to other techniques being researched—such as ultrasonics, lidar, and stereoscopic imaging—for a variety of

systems, including occupant sensing, parking assistance, pedestrian detection, and collision avoidance. "It provides a comparatively low-cost, chip-based 3-D camera that could serve multiple applications from a single installation," Arita said.

Canesta's sensors act like camera chips, but instead of seeing their surroundings in terms of light and darkness and a palette of colors, the devices continuously sense the distance to nearby objects—in any ambient light condition—and provide a stream of 3-D image data that can be further interpreted by the vehicle. Canesta's electronic perception technology has been in development for more than six years and is covered by more than 17 patents.

NEWS BRIEFS

OSA leadership: As of Jan. 4, 2007, Anthony Campillo will join OSA as its senior director of science policy. In this capacity, he will provide strategic direction on the Society's scientific programming, leveraging his technical expertise to help expand OSA programs and activities. Campillo is an active volunteer and fellow of OSA, currently serving as editor-in-chief of Optics Letters. Campillo has more than 40 years of experience in optics and photonics and has been a member of OSA since 1966.

Bigger digs: Lytron (Woburn, MA) recently opened a new factory and corporate office space in Woburn, doubling its square footage and increasing its manufacturing capabilities. The company says it is positioning itself for continued growth and needed to make room for equipment and the addition of staff from its recent acquisition of Lockhart Industries. Lytron purchased a building adjacent to its existing facility in 2004, and started renovations and construction in 2005. Lytron now occupies more than 115,000 square feet of space.

LEOS award: Three senior Infinera (Sunnyvale, CA) engineers—Charles Joyner, Radha Nagarajan, and Richard Schneider—are being honored with the Aron Kressel LEOS Award for their contribution to the development of the Infinera photonic integrated circuit (PIC). The annual Aron Kressel LEOS Award recognizes important contributions to opto-electronic device technology, with an emphasis on "technology which has found its way into widespread usage," according to LEOS. The award will be presented at the LEOS annual meeting in Montreal, Canada on Monday, October 30, 2006.

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more small company addressing a relatively small market niche with a relatively expensive technology. So the company has focused on creating advanced sensing technology for use in harsh environments that is also modular enough to cross over several different niches in the sensing market.

In addition, "Sabeus does not live by lasers alone," de Fusco said. Over and above providing systems for specific market groupings, such as applications in defense, and oil and gas sensing, Sabeus also maintains a competitive price point by further distributing costs over the sale of optical components that include both laser sources and gain-flattening filters, and by licensing its core technology to major players in defense, oil and gas, and telecom markets.

The core technology is a micro-processor controlled feedback loop that the company calls a multi variable control system (MCVS). In the company's AG-1 integrated laser sub-system introduced on October 2, the output of a distributed feedback (DFB) semiconductor laser is sampled by an optical reference several thousand times per second and fed back to a user programmable microprocessor that adjusts DFB temperature and input current to maintain stable output over varying operating conditions. The integrated subsystem includes TE cooler, laser driver, power regulator, and embedded microprocessor in a 3" x 4" x .5" package that weighs 9.2 ounces and pro-

vides between 10–50 milliwatts while typically consuming about 4 W of power.

As systems and devices based on this technology head into interferometric sensing applications primarily with customers in the defense or oil and gas industries next year (and extends further into test and measurement and telecom markets) de Fusco expects potential customers in a broad array of other potential markets to take note for three primary reasons.

The feedback system provides a dynamic noise cancellation function that enables the laser system to operate reliably in spite of vibration, shock and other microphonic interference in harsh environments. The device is tunable across C and L bands minimizing the need for spare lasers. And frequency stability of plus or minus 5 MHz, two orders of magnitude improvement over typical DFB performance, is expected to act as an enabler for dynamic network configuration. So in addition to sensing pressure waves for seismic measurements in the petroleum industry or for detection of movement in defense and security applications, the technology might also find uses such as real-time monitoring of helicopter blades or the skin of aircraft for signs of wear and impending failure.

"Customers have been precluded from doing this type of thing before because of cost effectiveness," de Fusco said. "Other issues remain, but a major stumbling block has been overcome."

—Hassaun A. Jones-Bey

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