OIDA News
OPTOELECTRONICS INDUSTRY DEVELOPMENT ASSOCIATION

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SPECIAL POINTS OF INTEREST:

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- Bridge & Tunnel Structural Health Monitoring (p. 3)

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Recent OIDA Forums Address Broad Elements of OE Landscape

In September, OIDA presented "Perspectives on the Optoelectronics Industry," a two-day forum which covered a wide variety of topics to provide a snapshot of the OE industry. Organized by Bill Ring, Fred Leonburger, and Waguih Ishak, the major OE topics included consumer, defense, computer, communications, industrial, and transportation. Nearly 40 speakers addressed these topics in a forum intended to provide a broad strategic overview. In consumer oriented technologies, the markets, applications, and progress on flexible displays, 3-D displays, ultra-small displays, and microprojection were examined, as were imaging and lighting. Various communications technologies from ultra-short interconnects (e.g., inside a cell phone) through automotive, computer interconnect, access (PON) networks, and ultimately long-haul were also examined. The forum also explored higher power laser applications from biomedical, materials processing, and machining. LIDAR, infrared, imaging, and processing for automotive applications, for instance for collision avoidance, provides another vast market for optoelectronic innovation. Lastly, the special needs of the defense and aerospace markets, while drawing from these technologies, require unique solutions such as fiber ring gyros and fiber optic perimeter monitoring. Two more forums are planned in 2008 to look specifically at manufacturing and R&D issues. *(Please see the related article in this newsletter for the Executive Summary from the OIDA report on this forum.)*

In early November, OIDA held a forum on the "Future of Optical Communications." Featuring presentations by Goldman Sachs' Jason Rowe on current and evolving market conditions, and Verizon's Stu Elby and AT&T's Mark Feuer on network planning and evolution, this 1 ½ -day forum looked at the next five to ten years of technology requirements for telecommunications. Examining the needs for 100 Gb/s and beyond transport, the degree to which optical reconfigurability is necessary, the evolution of the access and metro networks, and evolving network topology to address changing traffic demands, the forum attempted to match the needs of system OEMs with the capabilities of component suppliers, and to identify any gaps.

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Mark your Calendars!

Upcoming Forums

OIDA's 2008 Calendar will be released shortly. In the meantime, mark your calendars with these informative and important OIDA forums! More details will be released soon!

Date	Event	Location
April 16	**Perspectives on Optoelectronics: Manufacturing**	**Doubletree San Jose**
April 17	**Perspectives on Optoelectronics: Innovation**	**Doubletree San Jose**
Sept. 9-10	**Optoelectronics for the Green Revolution**	**Boulder/Denver**
Sept. 30 - Oct. 1	**Photonic Integration**	**Monterrey, CA**
Nov. 17-18	**OIDA's 17th Annual Forum**	**TBD**

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President's Letter

OIDA's 16th Annual Forum

Michael Lebby, OIDA President & CEO

As we all prepare for the holiday season, I would like to reflect on a major event for OIDA this year, our 16th Annual Forum on Optoelectronics, which was held in Washington DC in early December.

With over 100 attendees, the feedback we received form this year's forum has been no less than terrific! However, I did receive one black mark! I have been told in the past that watching me speak is like drinking from a fire hose! Ah – all that data I show! This year was no exception as I quickly covered optoelectronics from displays, to lighting, to communications, to solar and many other exciting areas for opportunities.

My talk focused on **green photonics** (OIDA will hold a forum on this in September), **plastic photonics** (OIDA will cover this subject in more detail in the 2008 market report and at PhAST in CLEO), and **100 G and beyond** (what's next for the networking community as capacity demand increases quickly due to video-based services).

The message to me was clear: we should convey our findings of the optoelectronic markets in more places throughout the forum, and take more time in doing it. I get it… slow down!

Key findings and observations from the 16th Annual Forum include:

1. Government: DARPA, represented by Deputy Director Bob Leheny, MTO Director John Zolper, and Program Manager Jag Shah, noted that the current UPR (Universities Photonics Research) program is finishing and DARPA is looking for leading edge photonic ideas to help design follow-on programs together with industry involvement and support.

2. Government: In the government funding of optoelectronics panel, Optoelectronics Program Director Ron Hui noted that photonics ranked 4th out of 12 technology programs at NSF this year. The leading technologies at NSF in 2007 seem to be energy (both transmission and generation) and bio related.

3. Government: NIST ATP Director (and TIPS acting Director) Marc Stanley spoke about the transition of the ATP (where photonics projects have been supported strongly over the last decade) to the new program called TIPS. Attendees at the forum heard how this new program would benefit leading edge technological programs in 2008. Initial funding may reach $100M in 2008 depending on House and Senate approval. Marc has asked OIDA to assist with organizing one of the workshops in the spring.

4. Industry: Telcordia Group Senior VP David Sincoskie remarked on the drive for more media rich services as the networks grow to accommodate consumer needs and desires over the next decade. Intelligent networked products that are appearing on the marketplace today will grow quickly to permit more efficient lifestyle choices in a decade.

5. Industry: Jo Major, President and CEO of Avanex, remarked that the consolidation of component level companies in the communications space has still not occurred, even though the bubble was nearly seven years ago. Jo indicated that there are now growing problems in areas of IP infringement that are adversely affecting US-based corporations. OIDA hopes to form a committee in this area of representatives from affected companies and will be looking to assist the industry on this matter in 2008.

6. Industry: Jerry Rawls, President and CEO of Finisar, remarked on the problems Finisar is having with fake GBIC fiber optic transceivers they have discovered at their customers' premises. Photos were shown of two GBIC transceivers that looked identical from the outside, but only one was manufactured by Finisar. It would seem that the Rolex and Gucci phenomenon of low cost replicas has now reached the photonics community. The concern is that this may be the tip of the iceberg and many companies in the photonics business may be suffering revenue loss from exact 'fakes.'

7. Industry: Terry Unter, President and CEO of Mintera, talked about his company's experience in trying to position and differentiate itself in a highly technical and competitive photonics environment – 40 Gbps. The basic message conveyed was to stick with it – there will be good and bad times, but in the end the folks who really focus and persevere will ultimately have the best chance to find that magic exit, be it an IPO or acquisition by a larger entity.

8. Industry: Bill Shiner, VP Industrial Markets of IPG, gave us an update of how high power lasers are being utilized by the heavy industries throughout the world. One of the messages conveyed was that the individual laser device performance was critical for the future. A single high power emitter that has very high efficiency and can be combined for high output power serves as a great solution for the industrial community. We have since coined the term "industrial surgery" and OIDA will be exploring more in this segment in 2008.

9. Academia: The current DARPA UPR centers presented the key aspects of their work in a poster session at the reception on the first day of the forum. OIDA forum attendees were to some degree surprised at the level of advanced photonics research work that was going on in the community. Exposing the UPR center research to senior industry members received positive feedback because it gave industry a peek at what's coming down the pike in a few years.

***Wishing you all a healthy and prosperous New Year!*|**

Michael

Bridge and Tunnel Structural Health Monitoring with Fiber Optic Sensors - An OIDA White Paper

On August 1, 2007, the collapse of the I-35 bridge in Minneapolis reminded us all of the consequences of catastrophic structural failure. As a nation, we need to commit resources to assure the safety of thousands of bridges and tunnels throughout the United States. Technologies are now available that can greatly enhance the ability to monitor changes in structures, indicate necessary maintenance, recommend load changes, and predict failure.

The Interstate Highway System, authorized by the Federal-Aid Highway Act of 1956, encompasses more than 47,000 miles of highway. The system is owned and maintained by the states with significant financial assistance from the Federal government. Some parts of the system are now 50 years old and built to standards, and with materials, which are now outdated. State and local highways are often even older, and built to an even greater variety of standards. Bridges are no exception: the Minneapolis bridge that collapsed was opened in 1967 and did not include the redundant truss structures commonly required in modern bridges.

With an aging infrastructure, constant vigilance and real time monitoring are critical to ensuring public safety. Operating loads, speeds, periodic environmental "shocks," and stress levels on these structures all create changes from the original as-built characteristics. Inspection protocols are intended to account for these factors, but nothing short of proactive, real time monitoring can provide a true warning system. Of course, such systems didn't exist when nearly all our infrastructure was built—but they do today.

Current maintenance regimes for bridges use two approaches: periodic visual inspection by trained inspectors, and occasional deep inspection using x-ray, infrared, or ultrasonic techniques. Neither system is real time and both systems require expensive equipment and manned truck rolls. Therefore, the inspection regimes are necessarily limited by cost. Since these inspection protocols are based on the judgment of highly trained inspectors, there is still room for varying interpretations. In addition, a detailed Federal Highway Administration (FHWA) study

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Recent OIDA Forums

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Lastly, OIDA's 16th Annual Forum was held in early December. The overall theme was "Global Competitiveness in Optoelectronics." The forum looked at the communications industry since the bubble, green technologies such as solar and solid-state lighting, industrial, and aerospace markets. Capital market changes (e.g., Sarbox), different investment strategies driven by new ownership structures, the current condition of R&D in the US and abroad, and policy issues that impede competitiveness (e.g., export control) were also explored. Featuring speakers from the Technology and Innovation Subcommittee of the House Science and Technology Committee and from the Office of Science and Technology Policy, the forum provided a broad overview of current initiatives in innovation development in the U.S. and identified a number of areas where the United States is lagging. The role of OIDA in helping the industry was also highlighted. ***Save the date for OIDA's 17th Annual Forum: November 18-19, 2008*.**

Speaker presentations are available to both OIDA members and attendees. Reports generated by these forums, and the breakout sessions, are available when published to all OIDA members free of charge. Non-members may purchase the reports at www.oida.org.

Washington News

Bad news for Science and Technology in FY2008 Appropriations

Until this week, the only part of the Federal Government that had received appropriations for Fiscal Year 2008, which began October 1st, was the Department of Defense. According to analysis by the AAAS - American Association for the Advancement of Science (http://www.aaas.org/spp/rd/dod08c.htm#tb2), DoD will spend $77.8B on R&D, a decrease of 0.5% from FY 2007. Basic research (6.1) will increase by 3.2%, but applied research (6.2) and development (6.3) will decline by 6.3% and 8.4% respectively. DARPA funding will decline by 9.6% to $2.8B.

The bill funding the Departments of Labor, HHS, and Education had been vetoed by the President because the amounts exceeded his requests, and an attempt to override the veto failed by two votes in the House. Vetoes were also threatened on several of the ten other appropriations bills. Faced with this reality, Congressional leaders accepted the President's limits and rolled the eleven remaining bills into an omnibus appropriations bill, which was passed on December 19 and is expected to be quickly signed by the President. Accurate apples-to-apples comparisons with prior funding are difficult to determine quickly, primarily because the bill contains $900 million in R&D earmarks. According to the AAAS, "basic and applied research" would grow at 0.4% at NSF, and 1% at both NIST and the DoE Office of Science. The new NIST TIP program will be funded, but at a much lower level than the last year of the ATP program it replaced. In any case, it is clear that R&D suffered substantially and plans to double research budgets at NSF, NIST and the DoE Office of Science, signed into law by the President in August, have generally been ignored.

Science and technology advocacy groups were not expecting such dramatic reductions over what Congress had included in earlier bills, and the response has been strong. Science Magazine called it a "heavy blow." The Task Force on the Future of American Innovations, made up of high tech companies and industry associations, said "The nations that seek to challenge our global leadership in science and innovation should be greatly encouraged by this legislation." ASTRA, another high-technology interest group, called the bill "Short-sighted and Short-changed." The President of the Association of American Universities said "In exchange for an arbitrary cap on domestic spending and thousands of earmarks, the Administration and Congress have sacrificed investments in research and education that would help assure our nation's long-term national and economic security."

OIDA President Honored as OSA Fellow

Michael Lebby, OIDA's president and CEO, has been honored as a Fellow of OSA.

Lebby's career has spanned all aspects of the optoelectronics and photonics business ranging from research and development, operations, manufacturing, and finance, to sales, marketing, and investing. He holds more than 175 U.S. patents issued in the optoelectronics and photonics field.

Lebby graduated with honors in the UK 1984 and started researching InP-based optoelectronic integrated circuits at RSRE in Malvern. In 1985, Lebby's research took him to AT&T Bell Laboratories photonics research division where he pursued OEIC-based themes that incorporated both optoelectronic and electronic device functionalities. In 1989 Lebby took his research studies to Motorola's Phoenix Corporate Research Laboratory in Arizona. At Motorola, Lebby developed highly reliable VCSEL based technologies and initiated Motorola's parallel optics interconnect program that was called Optobus™. As an R&D leader, Lebby led his research team to qualify the VCSEL and packaging technology using traditional Motorola qualification procedures. Lebby broadened his optoelectronic R&D skills through his role as Business Technology Development Manager in 1997. In this role, Lebby managed all aspects of advanced technologies in corporate R&D that included micro-displays, organic LEDs, laser diodes and detector arrays.

In August 1998, Lebby joined AMP (now Tyco) as a member of the Global Optoelectronics Division's management team. At Tyco he was responsible for growing the fiber optic datacom and telecom business through external interactions that included mergers, acquisitions strategic alliances, and technical strategic planning. Lebby drove Tyco's return into the 1 Gbps Ethernet transceiver market based on VCSEL technology. During the summer of 1999, Lebby joined Intel as a corporate investor and was responsible for sourcing, negotiating, and closing private placement equity deals in the optical networking, component, and semiconductor arenas. Lebby participated in a number of board level activities in the optoelectronics sector.

In January 2001, Lebby founded a new fiber optics company, Ignis Optics, where he served as the CEO. Lebby led the company to secure multinational customers in the telecommunications market. Lebby's team helped define the XFP standard for 10 Gbps transceivers, which gave the company market leadership on a global level. Ignis Optics was acquired by Bookham Technology in October 2003 and Lebby became responsible for corporate and technical strategy at Bookham Technology.

Dr. Lebby joined OIDA as Executive Director in early 2005 and was elected as the new president and CEO of OIDA on February 17, 2006.

In November 2005, Lebby was elected an IEEE Fellow for contributions to optoelectronics technology, and in November 2007, Lebby was elected an OSA Fellow for photonics leadership and contributions to VCSEL technology.

"OIDA's focus will be to broaden the horizon of optoelectronics and photonics, develop a pre-eminent membership base, and leverage government connections," Lebby explained. "We want to become the primary reference in photonics and maintain a focus on quality."

PTAP—Photonics Technology Access Program

A Successful Program Comes to an End

OIDA issued the final solicitation of the Photonics Technology Access Program [PTAP] on December 7, 2007, with a due date of January 30, 2008. Since the Program officially ends in July 2008, OIDA made changes to the solicitation to reflect the relatively short timeline to review proposals, issue purchase orders, and pay the vendors.

The National Science Foundation and the Defense Advanced Research Projects Agency have sponsored PTAP for over five years. During this time, researchers from over 85 different academic institutions and 110 vendors have participated in the program. Hundreds of faculty, research staff graduate and undergraduate students have benefited from the devices procured with PTAP funds. The program successfully built and strengthened relationships between academic researchers and industry. OIDA is proud to have been able to act as the broker for this activity.

Bridge and Tunnel Structural Health

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in 2001 concluded that “in-depth inspections are unlikely to correctly identify many of the specific types of defects for which this type of inspection is frequently prescribed.” The study reported that when inspectors checked welding points, for instance, less than 4% of them correctly identified the presence of cracks.[]

Fiber optic-based structural health monitoring offers a substantially improved regime for monitoring bridge and tunnel safety, especially structures with known structural deficits like I- 35W. By placing an optical fiber with special sensing elements built into the glass along or within a structure, an immediate readout of stress and positional changes is available with relatively inexpensive equipment. Fiber optic sensors of this type can be extremely sensitive, detecting strain shifts that would occur, for instance, in cracked welds, as well as providing other useful data such as wind and traffic loading. In addition, continuous monitoring with fiber optic sensors allows a new capability, which far exceeds current ability to detect structure degradation. Dynamic bridge testing, where the bridge is ‘pinged’ with a mechanical jolt and the structure is continuously scanned for responses, can indicate hidden cracks that don’t show positional changes until they fail.

Fiber optic sensing devices are designed so that problems can be located quickly, authorities can be alerted proactively, and traffic load can be altered to avoid a failure. The fault can then be repaired or, if necessary, the structure replaced. Moreover, this equipment can be used both periodically during an inspection (like dynamic bridge tests) and continuously in real time, offering a historical and current view of bridge or tunnel conditions. Best of all, fiber optic-based sensing systems are not just for new structures; existing structures can be retrofitted with these sensors, while repair or replacement requirements are determined. Future structures can have these sensors embedded for maximum performance.

A large number of North American companies are pioneers in ‘smart structures’ technology. These include LxSix, which sells devices that integrate into an optical fiber and can detect minute changes in strain, length, and temperature. Micron Optics sells complete structural health monitoring systems, and Optiphase, makes systems that scan fiber sensors to determine their current status. Some other companies making components or systems include JDSU, Oz Optics, FISO, Redfern Integrated Optics, and Integrated Optical Systems.

Installing a typical real-time fiber optic system can cost from $50,000 to $300,000. This compares favorably to the $100 million plus cost for replacement of major bridges and an average of 10% of that for major repairs. If repair or replacement can be delayed by even one year, the interest charges alone will pay for the system. Furthermore, it is likely that fully-instrumented bridges will have reduced insurance and maintenance costs. Lastly, a bridge failure imposes huge economic costs; the failure of the 35W bridge is estimated to cost $400,000 per day. While these economic arguments are extremely compelling, they pale in comparison to the human costs of bridge failure.

With nearly 600,000 bridges in the national inventory and over 70,000 deemed ‘structurally deficient’ [], like the 35W bridge, the U.S. has the monumental task of monitoring and managing repair, replacement, and traffic flow. It is logistically impossible that the frequent inspection, repair, and upgrades of these bridges can happen immediately even with government capital. However, knowledgeable and trained personnel can be focused in their monitoring, management, and repair efforts when aided by modern, practical, real-time systems.

There is no absolute way to prevent tragedies like 35W, but as we rush to react to the disaster, consideration of technologies and techniques that provide a cost effective method to greatly reduce risk and the ultimate cost of such events should be considered. The cost of retrofitting or embedding these sensing technologies into bridges is substantially less than the cost of catastrophic failures. As a complement to traditional inspection techniques, fiber optic sensing provides a real-time, continuous monitoring capability and accuracy that cannot be matched.

Fiber optic sensing technology is proven and commercially available today from many vendors. It is being deployed in China, Japan, and Europe. In the U.S., there have been deployments in Manhattan, Oregon, and New Mexico, but it is still on a limited basis. Let us give our states and cities these tools. Now, with a well-known need to cost-effectively monitor and systematically address our lagging infrastructure assets, the U.S. should not be on the trailing edge in applying these capabilities. We lead the world in developing and producing these technologies—let’s use them for our own benefit.

[1] Phares, Brent M., Rolander, Dennis D., Graybeal, Benjamin A., and Washer, Glenn A., US-DOT, Federal Highway Administration, http://www.tfhrc.gov/pubrds/marapr01/bridge.htm, March/April 2001.
[2] National Bridge Inventory, US-DOT, Federal Highway Administration, http://www.fhwa.dot.gov/bridge/fc.htm, updated 2006

An Excerpt from OIDA's "Perspectives on Optoelectronics" Forum Report

The "Perspectives on Optoelectronics: Advances, Challenges, and Growth Opportunities" forum in San Jose was extremely well attended. We are pleased to provide you with both the Foreword and the Executive Summary from the report.

Foreword

I would like to personally thank the keynote speakers who set the scene for the forum and addressed many topical and challenges issues for the audience and industry in general. Henry Kressel, Managing Director, Warburg Pincus, gave a thoughtful, challenging talk on the future of the technology industry and where the key trends were going. David Morse, Senior VP of R&D at Corning (and OIDA Chairman), reviewed some the key opportunities for photonics in a wide ranging portfolio of applications and markets. I would also like to thank our key sponsor for the event, DARPA MTO.

With over 100 attendees and a scope that covered six major themes in photonics applications, the forum brought together people from many industries to discuss opportunities both within and outside of their normal target businesses. As these types of events are a challenge to organize and attract senior industry representatives to, feedback to OIDA was very positive indeed in these areas.

Executive Summary

OIDA membership is greatly concerned that, from a global perspective, the United States is falling behind in the manufacturing, packaging, and assembling of optoelectronics products. Innovating technology may also be imperiled. This report is the result of the first of three forums sponsored by DARPA, "Perspectives on the Optoelectronics Industry: Advances, Challenges and Growth Opportunities." The second and third forums will encompass manufacturing and innovation, respectively, in 2008.

The forum explored six major sectors in optoelectronics: consumer/personal, computer, communications, transportation, industrial, and defense. This report details the trends, findings, and directions for optoelectronics in each of these market applications. Included in the first chapter of this report is the global optoelectronics summary that was compiled by OIDA in 2007. The forum also explored how optoelectronics is being utilized to enable innovative new products and applications in today's digital markets from a global perspective.

At the very highest level, the forum concluded that the following global trends are occurring in the digital (and subsequently optoelectronics) world:

1) Our lifestyle will evolve over the next decade and drive optoelectronics technology to new levels of application, use, and effect.

New applications for, and use of, optoelectronics will foster innovation quickly and effectively over the next decade. We are already seeing exciting levels of new human phenomenon appear with the sharing of optoelectronic based products such as video, photos and communicators (such as mobile phones and personal digital assistants). We have even envisioned the communicator platform to evolve to a wireless-based mobile medic with optoelectronics functions, be it a sensor, data management device, or simply a portable approach to monitoring the user's medical health. These ideas in turn are providing a strong impetus to more fully utilize the communications network to deliver media-rich services such as IPTV and video-on-demand. Private capital will selectively support those opportunities that quickly enter into the industrial marketplace.

Optoelectronics is a diverse industry embracing a rich photonics technology capable of truly remarkable innovations. Fundamental changes have already been effected by fiber optic transport in communications, flat panel in displays, non-intrusive medical diagnostics, light-emitting diodes in signaling, and general illumination. Fashion will eventually become a strong vehicle for optoelectronics over and above LEDs which have been used in children's shoes. Over the next decade, new fabrics will be made of photonic materials and clothing will integrate signaling and displays. During the next decade, we expect to see many more life-changing applications that will be optoelectronics driven.

Our second global trend from the forum:

2) A major economy such as that of the United States must maintain selected manufacturing to remain competitive in the next decade.

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Perspectives on Optoelectronics

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This is especially true in optoelectronics where an off-shoring manufacturing trend has accelerated over the last decade. There are signs that the movement off-shore may well be peaking as the issues of labor are certainly no longer at the top. In addition, we found at the forum that the protection of optoelectronics design centers will be critical for the U.S. to maintain superior defense optoelectronics product performance in the future. Government policies must encourage domestic manufacturing in optoelectronics for the United States to remain competitive.

This leads us to our third global trend:

3) The U.S. will experience continuing consolidation as optoelectronics innovation and marketing become increasingly integrated on a global scale over the next decade.

The third global trend will hold true not only for optoelectronics, but for digital technology in general. The last few decades have driven towards global commerce, a trend which is expected to continue. The concern for the United States will be: the threat of loss of intellectual property and key skilled labor from our advanced technological training at our colleges and schools. While the U.S. might be gaining economically from increased business as companies expand to undertake commerce on a global scale, we see optoelectronics suffering from IP infringement and loss of competitive skills.

The following list encompasses a number of key technological findings from the forum:

1. Television is king, and will drive display technologies and photonic innovations to new highs. Over the next decade, we expect to see the rise of LEDs as backlights, laser projection using red, green, blue semiconductor lasers and MEMs scanners, active matrix organic displays both small molecule as well as polymer, and electronic inks.
2. The television will become mobile: communicators will carry movies, shows, and videos for users to use any time, any place. Broadcasting will evolve to network-based distribution.
3. Microdisplays and projection will become more popular as users begin to find novel ways to utilize their life on the move. Heads-up displays integrated with communicators that can project displays are two examples of radical lifestyle changes that will emerge with new optoelectronics technology solutions.
4. Substrate and materials technologies in the display, lighting, and solar fields have evolved from wafers over the last two or three decades to glass panels today. This trend will continue with strong manufacturing competences in Asia. However, we see a growing trend toward flexible, non-rigid substrates over the next decade.
5. Plastic photonics will emerge as a new and exciting industry that has the potential to be manufactured outside of Asia. Plastic photonics includes organic LEDs, photovoltaics and novel displays. One key advantage is flexible substrate (roll-to-roll) manufacturing that employs similar tooling as used in the printing industry. ‘Throw-away’ displays that can be printed will change the way manufacturers and publications advertise and convey information.
6. “Green” photonics will emerge as a new technology area with wide ranging applications that will bridge many industries. Green photonics will not only include solid-state lighting and solar, but will grow to include energy efficiency and heat removal in communications as well as environmental conservatism in optoelectronics-based applications.
7. Wafer-based optics will become more integrated with electronics and optoelectronic devices, thus driving higher and more functional optoelectronic solutions for products.
8. High power lasers and associated modules for industrial and defense applications will follow similar footprint trends as the transceiver/transponders and EDFAs for communications: smaller, denser, and more efficient over the next decade. Power levels are expected to increase over the decade.
9. Transportation will utilize significantly more optoelectronics in consumer markets such as collision sensing, vehicle sensing, image viewing, LIDAR, POF, heads-up displays, solid-state lighting, and fiber optic communications.
10. The communications network will accelerate to accommodate 100 Gbps and beyond. While today the industry is concerned with the upgrade cost from 10 Gbps to 40 Gbps (on the order of 4X), over the next decade the demand for higher capacity networks that incorporate 100 Gbps will drive carriers to implement this technology even with significantly higher cost levels (10X to 30X).
11. The dynamic network will evolve quickly over the next decade with pressure to simplify optoelectronic modules, devices, and substrate materials. Devices will be expected to operate un-cooled, and even on non-crystalline substrates such as glass, sapphire, or flexible organic. Modules will be expected to be hot-pluggable and interconnect cables may evolve toward active cable designs where the optical connectors are not needed.
12. 3D displays may evolve to become important technologies to add value and features to consumer products ranging from televisions to communicator displays, especially those that require no eyewear to view.
13. The digital still camera and CMOS image sensor will grow in popularity so that communicators will be digital still camera (DSC) based as opposed to being wireless RF based in a decade. Consumers want to be able to record life in a mobile environment.

OIDA Membership Update

Welcome to New OIDA Associate and University Affiliate Members

OIDA has added the following seven new members since our last newsletter, bringing OIDA membership to historic levels.

Luxtera (http://www.luxtera.com) developed a Silicon Photonics technology platform that enables a new breed of monolithic opto-electronic devices manufactured in a low cost CMOS process. Its vision is to deliver economic optical connectivity everywhere, from network level to intra-system level, and eventually chip-to-chip. Today, the company is applying this technology to single chip transceiver products that aim to deliver optical performance at cost points associated with legacy copper solutions.

Lumera (http://www.lumera.com) was founded in October of 2000 to develop high-performance optical network components using electro-optic polymer materials. As the company progressed, Lumera was able to get initial funding which eventually led to a successful IPO in July of 2004. Today, Lumera is a company of about 60 people – one third of whom are PhDs – and has intellectual property consisting of over 70 patents.

Fraunhofer's Heinrich-Hertz-Institut (http://www.hhi.fraunhofer.de/english/). Innovations for the digital future are at the heart of research and development work carried out by the HHI. The Institute is concentrated to develop the principles of information technology and to demonstrate new applications for new products in partnership with the industry. The core competencies of HHI are in the areas of Photonic Networks and Systems, Mobile Broadband Systems, Photonic Components and Electronic Imaging.

Lamina (http://www.laminaceramics.com) was founded in 2001 and defines the state of technology in the development and manufacture of super-bright LED light engines. The company's leading edge LED packaging technology and design, and its proprietary multi-layer ceramic on metal packaging solution provides unsurpassed thermal management and interconnectivity. Lamina's technology emerged from 12 years of research and development at the Sarnoff Corporation.

Veeco Instruments (http://www.veeco.com) provides the tools to make, measure and visualize today's world-changing technologies. From data storage, semiconductor, LED, and wireless to the frontiers of life science, materials science and nanotechnology, Veeco drives the tiny changes that change everything.

Arizona State University's Center for Nanophotonics (http://www.asu.edu/aine/nanophotonics.htm) gathers a large group of faculty members from various disciplines to foster new ideas and to carry out collaborative research with enhanced inspiration. It integrates a broad spectrum of research topics ranging from fundamental study of photon-matter interactions to practical optical sensors for medical and biological applications. The center coherently merges education and research by embedding one in the other.

Mintera Corporation (http://www.mintera.com) is a global leader in high speed transmission systems. Mintera's solutions enable easy deployment of next generation 40 Gbps optical transport in metro-core, regional, long- haul and ultra long-haul optical networks. With products ready for deployment today, we are the company to turn to when you need help implementing 40 Gigabit per second (Gbps) solutions.

Optoelectronics Industry Development Association

The Optoelectronics Industry Development Association (OIDA) is a Washington DC-based, not-for-profit association that serves as the *focal point for vision, transformation, and growth* of the optoelectronics industry. OIDA advances the competitiveness of its members by focusing on *the business of technology*, not just technology itself.

Chairman, David Morse, *Corning*
President, Michael Lebby, *OIDA*
Treasurer, John Dexheimer, *First Analysis*
Secretary, Clark McFadden, *Dewey Bal-*

Check out OIDA's new and improved website for the latest news and to access exclusive members - only resources

www.oida.org