LIA TODAY

THE OFFICIAL NEWSLETTER OF THE LASER INSTITUTE OF AMERICA

The international society dedicated to fostering lasers, laser applications, and laser safety worldwide.

FOCUS: LASER SAFETY | VOLUME 20 NO. 3 | MAY / JUNE 2012

ILSC®

INTERNATIONAL LASER SAFETY CONFERENCE

The World's Leading Laser Safety Conference

Pg. 6

Ensure Your Facility's Safety

Pg. 8

LME 2012 - North America's One-Stop Laser Showcase Expands Educational Offerings

Pg. 10

New ANSI Z136.8 - Improves Laser Safety in the Research Lab

Pg. 14

Laser Institute of America

Laser Applications and Safety

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IN THIS ISSUE

FEATURES

DEPARTMENTS

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LIA TODAY

THE OFFICIAL NEWSLETTER OF THE LASER INSTITUTE OF AMERICA

LIA TODAY is published bimonthly to educate and inform laser professionals in laser safety and new trends related to laser technology. LIA members receive a free subscription to *LIA TODAY* and the *Journal of Laser Applications*® in addition to discounts on all LIA products and services.

The editors of *LIA TODAY* welcome input from readers. Please submit news-related releases, articles of general interest and letters to the editor. Mail us at *LIA TODAY*, 13501 Ingenuity Drive, Suite 128, Orlando, FL 32826, fax +1.407.380.5588, or send material by e-mail to lia@lia.org.

CALENDAR OF EVENTS

Laser Safety Officer Training
June 26-28, 2012 | Chicago, IL
Dec. 4-6, 2012 | Orlando, FL

Laser Safety Officer with Hazard Analysis*
June 11-15, 2012 | Boston, MA
Sept. 24-28, 2012 | Anaheim, CA
Nov. 5-9, 2012 | San Antonio, TX
**Certified Laser Safety Officer exam offered after the course.*

Medical Laser Safety Officer Training*
June 9-10, 2012 | Boston, MA
Sept. 22-23, 2012 | Anaheim, CA
**Certified Medical Laser Safety Officer exam offered after the course.*

International Congress on Applications of Lasers & Electro-Optics (ICALEO®)
Sept. 23-27, 2012 | Anaheim, CA

Laser Welding & Joining Workshop
Oct. 23-24, 2012 | Schaumburg, IL

Lasers for Manufacturing Event (LME™)
Oct. 23-24, 2012 | Schaumburg, IL

International Laser Safety Conference (ILSC®)
March 18-21, 2013 | Orlando, FL

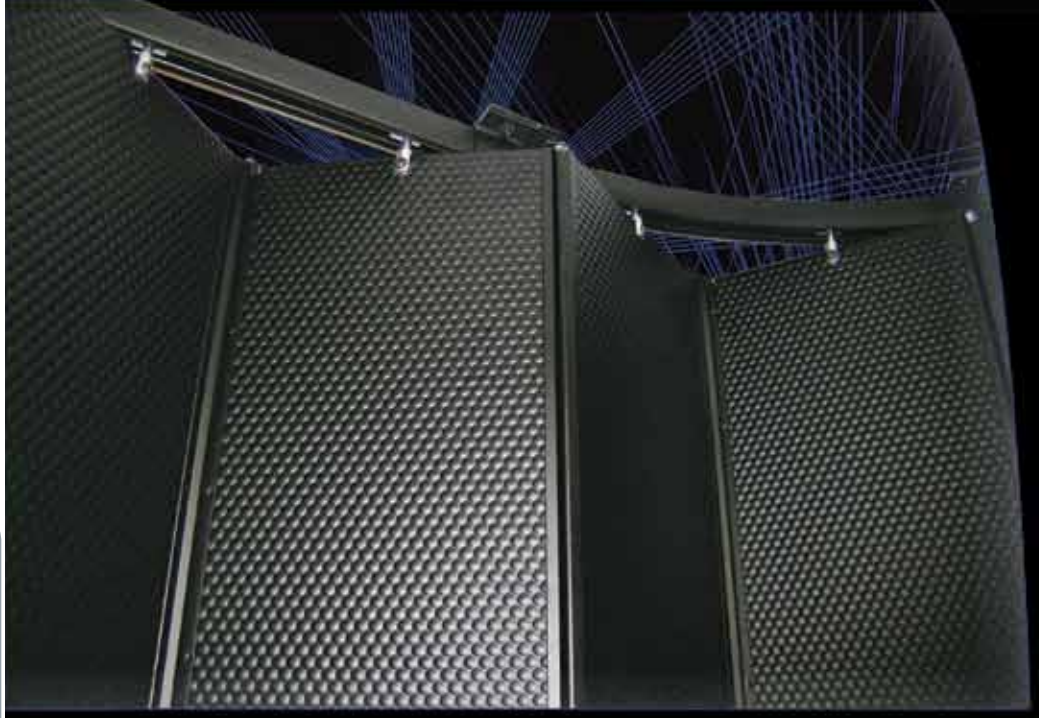
*Visit **www.lia.org** for all course and event listings.*

ABOUT LIA

Laser Institute of America (LIA) is the professional society for laser applications and safety. Our mission is to foster lasers, laser applications and laser safety worldwide.

We believe in the importance of sharing new ideas about lasers. In fact, laser pioneers such as Dr. Arthur Schawlow and Dr. Theodore H. Maiman were among LIA's original founders who set the stage for our enduring mission to promote laser applications and their safe use through education, training and symposia. LIA was formed in 1968 by people who represented the heart of the profession—a group of academic scientists, developers and engineers who were truly passionate about taking an emerging new laser technology and turning it into a viable industry.

Whether you are new to the world of lasers or an experienced laser professional, LIA is for you. We offer a wide array of products, services, education and events to enhance your laser knowledge and expertise. As an individual or corporate member, you will qualify for significant discounts on LIA materials, training courses and the industry's most popular LIA conferences and workshops. We invite you to become part of the LIA experience – cultivating innovation, ingenuity and inspiration.



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The World's Leading Conference on Laser Safety

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SAVE THE DATE

March 18-21, 2013 | Orlando, FL USA

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Featuring:

Laser Safety Scientific Sessions
Technical Practical Applications Seminar
"Hot Topic" Luncheon
Awards Luncheon
Returning for 2013! Medical Practical Applications Seminar – Earn contact hours while experiencing cutting-edge presentations

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www.lia.org/ilsc

PRESIDENT'S MESSAGE

The second decade of the 21st Century one day very well may be considered as the "Period of China's global conversion." For many years, the country was mainly or even exclusively dealing with and in itself, trading only negligibly internationally, bringing into China whatever was felt to be of benefit for the country. However, in more and more areas, the collaborations as well as the investments on the international and transatlantic level increase drastically. Acquisitions of real estate, industrial and material resources show steep increase and entanglement with global entities.

On the other hand, the international view on China changes as well. In very recent years many industries looked to the eastern giant extremely skeptically, the fear of low price takeover of international business exceeded potential opportunities by far. In the last few years or maybe even months, the high-tech industry especially sees and increasingly creates opportunities for true win-win situations. The growing rate of Chinese patents consequently leads to a view of increasing acceptance of the rights of other international partners. In the meantime, the majority of industrial research partners in Aachen for instance, see more opportunities than threats in collaborations with Chinese partners.

Also in the academic area the activities on lasers and photonics open up. Five years ago, a first MP3-strategic workshop for Materials Processing with Photons, Plasma and Particles was organized highly internally. This year, the MP3 conference in Wuhan on November 1-2 will show domestic and international state-of-the-art technology and presentations in the "Optical Valley" of China, where laser companies add up to about $500 million of turnover. The event will be a great opportunity to explore individual opportunities.

Obviously, the Obama administration and the president himself not only realize the need for improvement of the U.S.-manufacturing base, but initiated an innovation process with the $1 billion manufacturing program. The domestic high-tech industry in particular has decreased over the last year and led to a negative trade balance even in this previously strong domain of the U.S. As a next international event coming up, LME 2012 in Chicago will be focused solely on the development of laser manufacturing in the U.S. The Event promises to increase significantly compared to the inaugural event in 2011 and will offer topical workshops on welding and ultra precision machining. It will be a great opportunity for the sorely needed improvement of the American manufacturing base. Be there!

LIA and its president wish you a productive and successful time.

Reinhart Poprawe, President, Laser Institute of America

EXECUTIVE DIRECTOR'S MESSAGE

LME, Leadership, LME!

Our fiscal year finished at the end of March and, subject to audit, we had an excellent year. Part of the reason was the success of our inaugural Lasers for Manufacturing Event (LME™) that depended on collaboration between our volunteer leaders and staff.

The adjacent president's message by Reinhart Poprawe demonstrates the breadth of knowledge and global perspective that our president, board and conference chairs provide.

As we look ahead, this collaboration will continue to guide everything we do, including (we hope) another successful LME and another good year for our society.

Peter Baker, Executive Director
Laser Institute of America
pbaker@lia.org

ILSC 2013 – THE WORLD'S LEADING LASER SAFETY CONFERENCE

By Geoff Giordano

Dr. Ben Rockwell, third-time chairman of the LIA's 2013 International Laser Safety Conference, loves his job.

"It has been an excellent experience where I get to invite the quality people out there trying to broaden our horizons and bring to ILSC® the cutting-edge latest and greatest in the laser safety field," says Rockwell, who is also chairman of the subcommittee that develops the ANSI Z136.1 *Safe Use of Lasers* standard. "Early on when I went to the ILSC conference back in the '90s, I recall learning from the giants in the field and also the opportunity to interact and network with the people who are experts and upcoming experts in the laser safety industry."

Rockwell plans another cutting-edge four-day session in Orlando, FL on March 18-21, 2013. He will ensure that ILSC again covers a broad range of must-have information.

"At the last ILSC (2011) we had a special session devoted to high-intensity light sources, which are not necessarily laser systems but are being applied widely and have similar analysis techniques as a laser system," Rockwell says. "LSOs are usually involved in evaluating those systems, so we brought the latest in what are the common characteristics of those systems and how they're applied. They're usually used in a medical setting where they do a dermal treatment for things like age spots and scars on tissues. The LSO can gain understanding and also an idea of how they can apply the laser safety standard to those particular systems."

Another element of ILSC's unique appeal besides its diverse content is its diverse audience. More than 200 people attended the 2011 conference.

"One can learn about future changes of the laser safety standards before they are published," says Laser Safety Scientific Sessions Chair Dr. Karl Schulmeister of Austria's Seibersdorf Laboratories. "Obviously it is also a great platform to meet and exchange ideas in a much larger group of experts than at a laser safety course. The exhibition by vendors and manufacturers is a good way to learn about new products related to laser safety."

Schulmeister has been involved with ILSC since 1996 in various roles. Among the trends that ILSC has addressed and will continue to address, he notes, include:

- High-power fiber lasers with long focal length delivery to the workpiece, which present a challenge for laser guards and enclosures.
- Hand-held materials-processing lasers.
- Laser consumer products and laser pointers.

Significant discussion is also likely regarding the impact of the newly published ANSI Z136.3 *Safe Use of Lasers in Health Care* standard and the ANSI Z136.8 *Safe Use of Lasers in Research, Development, or Testing* standard. Both are available from LIA at **www.lia.org/store** as well as the ANSI Z136.1 and IEC 60825-1 standards.

With Rockwell at the helm of ILSC, expect a comprehensive look at the particulars of those critical guidelines.

"I work with the bioeffects standards community and ask them for areas in which they need more data, then I collect that data; it helps in determining the maximum permissible exposure levels," he notes. "If there are any changes up and coming, I like to make sure the changes are based on real physical phenomena that occur.

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We do the analysis and experiments to determine how the laser system that we have can help out the laser safety standards. On a more practical level I use the laser safety standards." In his role as principal research physicist at the Air Force Research Lab in San Antonio, Texas, "we have a large number of labs with Class 4 laser systems with a wide variety of pulse durations, exposure durations and wavelengths, and we apply the laser safety standard that I helped write."

MEDICAL PAS

ILSC will again feature a two-day Medical Practical Application Seminar (PAS).

On the medical side, attendees will learn the basics like the best way to perform safety and hazard calculations and the ideal way for Laser Safety Officers to select standards and include their personal interpretations in applying them. But they'll also get more advanced topics like the study of fume extraction and the latest maximum permissible exposure changes, and how those are relevant to the bioeffects that occur in humans.

"We are very excited about the educational opportunities to be presented at the 2013 ILSC conference," says Vangie Dennis, chair of the two-day Medical PAS. "Highlighted topics will be the 2011 ANSI (Z136.3) standard. Paralleling that lecture will be an overview of the 2011 Association of periOperative Registered Nurses (AORN) *Recommended Practices for Laser Safety in Perioperative Practice Settings*. The recommended practices from AORN focus on clinical applicable practice while optimizing laser safety by essentials of appropriate hazard assessment with a patient focus. New and innovative types of laser systems will be discussed and new services are continually transitioning. We'll always have a section on aesthetics because that industry changes quicker than anything."

Dennis says new and evolving laser systems in medical practice include:

- Femto systems for cataract surgery.
- Gastroenterology procedures that are taking technology that worked well in a ureter and applying that to the bile duct using the SpyGlass Direct Visualization System.
- Cardiovascular techniques in which an external laser is used to cut a rotary route in conjunction with balloon angioplasty or the Angio Jet. "It's a combination technology that optimizes outcomes," explains Dennis, RN, BSN, CNOR, CMLSO, administrative director for the Spivey Station Surgery Center outside Atlanta.

TECHNICAL PAS

"In the past several years, ILSC has undergone a little bit of a transformation," says Ben Rockwell. "We've tried to make it go more from a technical conference to include more practical applications. In the upcoming ILSC, we'll have two days devoted solely to what we're calling the technical practical applications seminar – that's the way it was in the 2011 conference. On those two days we present the application of the standards, an understanding of how to do measurements, analysis and control measures, and an understanding of how light interacts with all those things and how a Laser Safety Officer (LSO) can execute a cutting-edge professional laser safety program in their facility."

In the Technical PAS, Chair Ben Edwards will stress "giving a boost" to LSOs on the front lines: professionals with laser safety responsibilities in labs, factories, classrooms and outdoor environments. The recession and its lingering effects mean that almost all LSOs outside the federal government have other primary job duties — so they don't have the luxury of focusing exclusively on laser safety.

"A primary goal of the 2013 Technical PAS will be to provide laser safety professionals with a set of ready-to-use tools designed to immediately improve their laser safety program, with an emphasis on high-impact approaches that maximize their return on time and effort invested," says Edwards, MS, CLSO, CMLSO, CHP, radiation safety officer at Vanderbilt University.

Given the sweeping adoption of lasers for so many disparate uses, LSOs of today and the future need all the information they can get to stay abreast of developments.

"Lasers continue to grow smaller, cheaper and more powerful, so that today we are confronted with extremely compact — sometimes even portable — and often inexpensive lasers that are nonetheless extremely powerful and quite dangerous," Edwards notes. "The size (or price) of a laser no longer provides any indication of its relative hazard." As a consequence, "The international marketplace has been flooded by inexpensive, low-quality but high-power laser products that may not comply with the product performance standards specified by regulatory requirements. LSOs may now discover that cost-conscious users have brought into the workplace lasers with hidden hazards and lacking even the most basic safety features."

Attendees can expect sessions of one-and-a-half hours, allowing six sessions in two days. "Several formats have been used over the years," Edwards explains. "The best approaches engage the participants, either with extremely timely discussions of significant emerging topics (e.g., the one-watt hand-held laser presentation at the 2011 ILSC), or by inviting the audience into small discussion groups that allow everyone to participate in lively exchanges of information. In either case, panelists provide recognized technical expertise, a wide variety of experience and the willingness to encourage audience participation."

ILSC NETWORKING

But as Rockwell noted, networking is also a significant part of the ILSC experience. A welcome reception will help orient new attendees and allow peers to catch up before digging in to the technical sessions. A sponsor reception will foster discussion of products, ideas, opportunities and practical solutions. For more information regarding ILSC 2013 sponsorship opportunities, please visit **www.lia.org/conferences/ilsc/sponsors**. ILSC also features a pair of luncheons — one "hot topic" event featuring a moderated panel discussion, and an awards event featuring presentation of the George M. Wilkening Award and the R. James Rockwell, Jr. Educational Achievement Award.

The call for papers to be presented at ILSC is in full force, the first deadline being Oct. 3 for abstract submissions; manuscripts will be due Jan. 17. Abstracts must be 100 to 200 words. For more information about submitting papers, registering to attend ILSC, or for updates regarding certification maintenance points, visit **www.lia.org/ilsc**. ■

Geoff Giordano is a freelance writer.

ENSURE YOUR FACILITY'S SAFETY

LIA PROVIDES ALL OF YOUR LASER SAFETY TRAINING AND RESOURCES

The Laser Institute of America (LIA) has been delivering quality, trusted laser safety training for over 40 years. Training is an integral tool for the safe use of lasers and laser equipment used in manufacturing, medicine and research today. As secretariat of the ANSI Z136 series of laser safety standards, the foundation of laser safety programs nationwide, the LIA has assisted laser users in developing and implementing safety programs worldwide.

The LIA is committed to keeping the workplace safe from hazards associated with lasers. Therefore, LIA offers a complete line of laser safety training courses for personnel in research, industrial and medical laser facilities and trains more laser safety officers (LSOs) than any other organization in the world. All of LIA's courses are based on the ANSI Z136 standards.

LIA's classroom-based courses include: Industrial Laser Safety Officer, Medical Laser Safety Officer, Laser Safety Officer and Laser Safety with Hazard Analysis. For dates and locations of courses offered, visit **www.lia.org/education/calendar**.

LSO ONLINE MEETS CANADIAN REGULATIONS

LIA offers a complete line of online courses for personnel in research, industrial and medical laser facilities. In fact, LIA's leading LSO online course now includes Canadian laser regulations. Noticing a significant rise in attendees signing up from Canada for the online Laser Safety Officer Training course, LIA Education Director Gus Anibarro responded quickly to address their specific requirements.

Among the key differences between U.S. and Canadian regulations, he says, is the Radiation Emitting Devices Act (REDA), which emerged from Canada's Department of Justice in 1985. "It is their version of our Center for Devices and Radiological Health (CDRH), where our government regulates laser manufacturers," Anibarro notes. "It regulates laser products that are sold in Canada. REDA applies to manufacturers, distributors, people who lease lasers and those who import lasers, including laser scanners and lasers for demonstration."

THE EVALUATOR

As a complement to all of its online training courses, LIA, in 2010, introduced the Evaluator, the industry's first web-based laser safety hazard analysis system that utilizes an innovative delivery system to provide a new and improved user experience for laser safety officers of all skill levels. This system provides a reliable way to easily double-check laser safety calculations. It is based on the ANSI Z136.1 *American National Standard for Safe Use of Lasers* and will perform repeated calculations of maximum permissible exposure (MPE), optical density (OD), nominal ocular hazard distance (NOHD), nominal hazard zone (NHZ) and laser hazard classification.

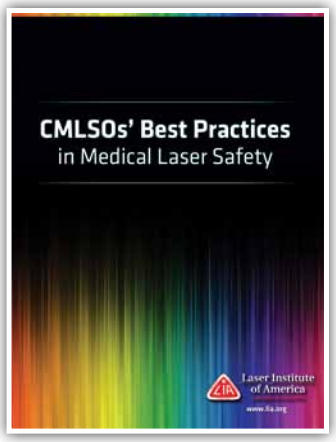
Benefits of the Evaluator include being able to change laser settings by easily switching between CW, single pulse or repetitively pulsed lasers as well as adjusting the beam profile, the ability to save reports, view graphs and make suggestions for new features and you can also experiment with various laser, eyewear or barrier combinations with enhanced interactive graphic displays.

OUT OF THE CLASSROOM

In addition to classroom-based and online courses, LIA also offers training through instructional videos, publications, onsite training and more.

LIA has assembled the expert knowledge of leading certified medical laser safety officers in a new book, *CMLSOs' Best Practices in Medical Laser Safety*. The book compiles the latest knowledge on establishing a medical laser safety program, including laser safety regulations, how to control and evaluate such programs and the duties of medical laser safety officers (MLSOs).

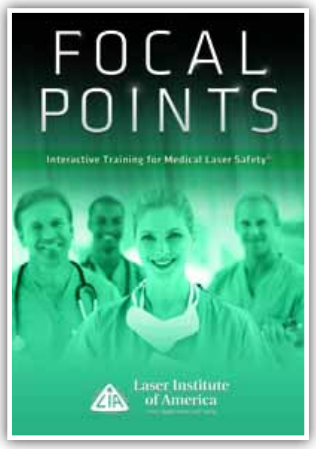
The 11-chapter book focuses on topics such as initial MLSO duties and responsibilities, beam and non-beam hazards and factors that determine laser-tissue interaction. The book's contributors also address the importance of safety audits once a laser safety program has been established. Packed with useful figures and tables, it includes samples of a medical laser safety inspection checklist, a laser inventory sheet, a laser procedure record and laser safety audit forms. This book's publication coincides with the release of the newly-revised ANSI Z136.3 *Safe Use of Lasers in Health Care* standard.



TRAINING VIDEOS

LIA training videos and CD-ROMs provide a cost-efficient and effective education tool and serve as an excellent resource for laser safety officers. Two are of particular note, one for all medical personnel and one for industrial facilities.

FOCAL POINTS – Interactive Training for Medical Laser Safety, an interactive CD-ROM, offers a user-friendly training program that medical laser safety officers can use to train their staff on the basics of laser physics, potential hazards and control methods and differences in laser systems. The ANSI Z136.3 *Safe Use of Lasers in Health Care* standard, as well as the Joint Commission and Occupational Safety and Health Administration (OSHA), require training for personnel as a component of any laser safety program.



Mastering Light DVD – An Introduction to Laser Safety, serves as an excellent resource for laser safety officers who are tasked with one of the most significant responsibilities in the organization—training new employees and keeping the team updated on current safety issues and practices. This DVD training option is easy to administer in the workplace. Written and produced by LIA, *Mastering Light* fulfills both the ANSI Z136.1 *Safe Use of Lasers* and OSHA training requirements for employees working with or around Class 3B or Class 4 lasers and laser systems. Presented in an easy-to-understand format, the 23-minute DVD covers the basic fundamentals of laser safety including beam hazards, control measures, bioeffects, classifications, non-beam hazards and more.

Don't settle for less, come to the leading laser safety source and get your laser safety training from your society, Laser Institute of America, publisher of the ANSI Z136 series of laser safety standards. Afterall, LIA is the international society dedicated to fostering lasers, laser applications and laser safety worldwide. ■

LIA'S FREE OD CALCULATOR

LIA has added a convenient online tool to its website that will calculate what optical density (OD) is recommended for use with a laser system of a given power. This OD calculator provides a reliable way to easily double-check laser safety calculations. Check it out at **www.lia.org/evaluator/od.php**.

LME 2012 – NORTH AMERICA'S ONE-STOP LASER SHOWCASE EXPANDS EDUCATIONAL OFFERINGS

By Geoff Giordano

LIA's Lasers for Manufacturing Event (LME™) takes a bold leap forward in its second year as exhibitors are being invited to bring working laser systems to the unique one-stop showcase for laser-based production.

Building on the momentum and overwhelmingly positive feedback of the inaugural event in 2011 in Schaumburg, IL, LME will return to the Renaissance Schaumburg Convention Center Hotel bigger and bolder on Oct. 23-24. LME 2012 will feature more basic courses and a pair of two-hour tutorials addressing welding and joining and ultrafast laser processes.

LME 2012 is building upon the success of last year's inaugural event.

EDUCATION AT LME

LIA has unveiled an expanded educational track this year. LME 2012 will again provide attendees vital guidance on how to create effective and efficient laser-based production systems to increase profitability in a broad range of applications, predominantly aerospace, automotive and medical.

LME 2012 will feature an expanded educational track.

Three new courses addressing the fundamentals of laser additive manufacturing, cutting and robotics have been added along with the two tutorials. These will appear alongside primer sessions on the main types of lasers used for manufacturing, creating laser systems and establishing the return on investment.

In addition, a new two-day Laser Welding & Joining Workshop, chaired by LIA past president and Schawlow award winner Prof. Eckhard Beyer of Fraunhofer IWS, will run concurrently with LME. "As many laser manufacturers and system builders are engaged in the workshop, this would be an ideal opportunity to get application-related questions answered and get new ideas on how to use lasers," Dr. Beyer explained. "We are going to unite many people from the laser community who are shaping the way the world of lasers is today. This will make it possible to address lasers from the basics to high-end applications."

The Welding & Joining Workshop will feature 18 presentations, spread out over two days to allow ample time for attendees to interact directly with OEMs in the exhibit hall.

"The workshop will start with short courses presented by industrial research experts to give a sound overview of laser basics and current developments. End users with long standing experience will present their solutions to the typical challenges of laser applications."

Some of those applications will include power-train welding, remote welding, hybrid welding and "micro" applications, he noted. Such applications are being refined constantly as lasers continue to evolve.

"We still see a big impact of the tremendous rise in beam quality and energy efficiency," Beyer says. "Here the application fields are expanded in many ways: ultra-low distortions or the realization of new mixed-material joints like copper-aluminum using precisely shaped weld pools. Also, remote-beam applications are now standard; that was a field restricted to expensive high-brightness lasers just a few years ago. Furthermore, laser size reduction is a key development; many lasers are now so small that machine integration is much simpler and can be done in a way not possible before."

FOCUS ON ULTRAFAST LASERS

Although slated as a tutorial this year, the program on ultrafast lasers could grow into another two-day workshop next year. For

LME con't from page 10

the inaugural session, LIA President Prof. Reinhart Poprawe of Fraunhofer ILT says the educational track will feature technical examples, a survey of Technology Readiness Level (TRL) 1-9 materials and an overview of markets and materials. He says the session will be particularly geared to those involved with optical systems and scanning technologies, as well as users of precision machining applications with accuracy in the range of 10 microns and below.

"The development of ultrafast lasers with pulse durations of some 100 femtoseconds to 10 picoseconds on an industrial scale with powers up to the kilowatt class, has led to a new level of laser processing with ultimate processing quality," stated Prof. Poprawe. "Starting with physical basics on ultrashort pulse interaction phenomena, the tutorial will give a survey on different applications from electronics, energy topics and tooling technology to large area processing for tribology optimization and surface functionalization."

The tutorial is particularly suited for engineers and scientists from machine suppliers and end users, Poprawe said. And "manufacturers of ultrafast lasers and optical systems (scanning technologies) will learn about the requirements on system technology with respect to laser parameters and processing parameters."

LIA is showing once again that it is at the forefront of advocating cutting-edge laser technology, as "ultrashort pulsed lasers are heading to the edge of mass industrialization and will undergo similar growth rates like other lasers in the past," Poprawe asserted.

Ultrafast lasers are being applied in the biomedical, automotive and tool and molding industries; LED and OLED light-guiding systems; photovoltaics and energy storage; and general surface processing. The tutorial will help shed some light on current debate over what kind of pulse lengths are optimal for what materials, how best to apply high-repetition lasers to workpieces and how researchers and manufacturers can concentrate on shortening manufacturing cycle times.

SAFETY EDUCATION

In addition to spotlighting the bottom-line benefits of lasers, the working systems at the Event will put the need for laser safety front and center.

LIA Education Director Gus Anibarro, who will be the event's Laser Safety Officer (LSO), will again give a one-hour presentation on assessing beam and non-beam hazards in the laser manufacturing environment and how to ensure the safety of operating personnel.

Just as he did at the first LME, Anibarro will condense his extensive laser safety experience into an information-packed session that highlights prevention rudiments addressed more fully in LIA's two-, three- and five-day laser safety courses (view LIA's full range of laser-safety courses and online resources at **www.lia.org/education/online**). The crash course in proper laser safety use will cover the classes of lasers, direct vs. reflected exposure, the need to control laser-generated air contaminants, skin and eye hazards and how to choose eyewear of the proper optical density.

NETWORKING MADE EASY

LME, held in proximity to a large number of manufacturers and job shops, is an all-in-one experience for those either seeking to refine current laser systems and applications or assessing potential new ways to employ lasers in production. While the educational program provides tools to help assess the benefit of investing in lasers, the exhibit floor provides a real-time marketplace to discuss applications and primary and ancillary equipment with top-tier suppliers.

To that end, LME will again feature the highly popular Laser Technology Showcase, a stage at the front of the exhibit hall that will be used for keynote educational presentations and shorter informational addresses by many companies in attendance. The showcase format helped foster interaction between attendees seeking solutions and a wide array of industry leaders able to lend their expertise in person.

Networking opportunities are abundant at LME.

As Mike Klos, general manager of Midwest operations for IPG Photonics in Novi, MI, summed up at the inaugural LME: "(At other shows) you get lost between the drill bits and the cutting oil. If you've ever looked at a laser application, this is the right place to come. Everybody's here."

To learn more about or register to attend LME, visit **www.laserevent.org**. ■

Geoff Giordano is a freelance writer.

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Principles of Lasers

July 24, 2012 Columbus, OH

This one day introductory course is designed for those responsible for operating and maintaining laser systems, providing a solid introduction to lasers. It also provides a knowledge base for those who plan to continue their professional development. In addition, the course benefits those who have management responsibility for laser and/ or laser safety.

Key Topics:

Laser concepts

Types of lasers

Laser output characteristics

Laser optics and components

Laser Safety Products

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NEW ANSI Z136.8 IMPROVES LASER SAFETY IN THE RESEARCH LAB

By Geoff Giordano

A new standard geared to lasers employed in research takes a "more realistic" approach to guiding safety officers overseeing such work, in which the use of customized laser devices and fiber optics is common.

American National Standard for *Safe Use of Lasers in Research, Development, or Testing*, the title of the new ANSI Z136.8 standard, also addresses injury prevention in specific areas where experiments are conducted.

"In the research setting, you're often dealing with lasers that don't have all the bells and whistles," explains Ken Barat, chairman of the subcommittee that developed the new standard. "Z136.8 recognizes that many lasers in the research setting are homemade and may not have all these controls, so I do not have to explain why they are missing to auditors. (Z136.8) allows LSOs to accept those things rather than say you're out of compliance."

The ANSI Z136.8 standard — LIA's latest offering in a range of vital resources for laser personnel — arose from the increasing reliance on lasers in labs and other research-designated areas.

"Laser applications in the research setting have been on a steadily increasing pace, in particular with the development of pico- and femtosecond lasers as well as nano laser technology," says Barat, Laser Safety Officer at Lawrence Berkeley National Laboratory. "The existing Z136.1 *Safe Use of Lasers* standard was becoming out of sync with these new laser applications in R&D."

Other highlights include guidance on export controls, the use of warning signs, inclusion of sample audit forms for labs and program reviews and deletion of some CDRH-based control measures. Z136.8 further distinguishes itself from the parent ANSI Z136.1 document by:

- Detailing two additional hazard analysis areas — beam path and beam interaction.
- Summarizing proper procedure in unrestricted, restricted, controlled, exclusion and inaccessible locations.
- Allowing the use of alignment eyewear.

"If I have a green laser that I'm trying to align and I put on eyewear that blocks all the green light, I can't do what I want to do," Barat says, meaning the user might opt not to wear protection. "(Z136.8) acknowledges that alignment eyewear lets you reduce the intensity of the beam but lets you see it."

"Laser safety in all research settings I know are an effort between the LSO and researcher," Barat concludes. "But research settings are more fluid. In industry, once the controls are in place, things are pretty much set for long periods of use. In medical settings, people work off a checklist for each procedure, and the doctor and nurses argue over eyewear use. In R&D a set up can stay the same with just different samples for years or change every few weeks following the path of the results or funding."

LIA, the recognized industry leader in laser advocacy and safety education since 1968, serves as secretariat of the Z136 series of laser safety standards, administering the process and providing support to the committee. To order the Z136.8 ($140 for LIA members, $160 for nonmembers), visit **www.lia.org/ANSI** or call LIA at 1.800.34.LASER. ■

Geoff Giordano is a freelance writer.

Standards on the Horizon

Starting with the release of the ANSI Z136.3-2011 *American National Standard for Safe Use of Lasers in Health Care*, a number of standards that have been in development for several years are coming to fruition.

As reported in this newsletter (see page 14, "New ANSI Z136.8 Improves Laser Lab Safety"), the *American National Standard for Safe Use of Lasers in Research, Development, or Testing* was approved by ANSI on April 3, 2012 and is now available for purchase. The procedures and methodologies described in the Z136.8 are based on requirements previously established in the Z136.1 and are intended to give more specific processes for accomplishing laser safety in R&D and testing settings. Oftentimes in these environments safety controls common for commercial lasers may be missing (non-existent) or disabled.

The long awaited replacement to the Z136.2-1997 standard that addresses the safe use of optical fiber communications systems has been approved at the consensus body level and will be submitted to ANSI for approval in the coming months. For those in telecommunications, this standard will provide guidance for the safe use, maintenance, service and installation of optical communication systems including end-to-end optical fiber based links, fixed terrestrial point-to-point free-space links or a combination of both.

Also slated to reach the market this calendar year is a new standard specific to safe laser use in the manufacturing environment. Laser applications in the manufacturing environment include, but are not limited to material processing, fabrication, laser alignment, leveling, inventory, metrology and machine vision. ■

ASC Z136
Safe Use of Lasers
Accredited Standards Committee

LASER WORLD OF PHOTONICS CHINA 2012: GRAND GATHERING WITH PROFESSIONAL BUYERS

LASER World of PHOTONICS CHINA 2012 successfully closed on March 22, 2012 at Shanghai New International Expo Center, China. The figures confirm its leading position in the Asian laser and photonics market: 475 exhibitors from 19 countries and districts exhibited at the trade show, an increase of 31.6 percent compared with 2011. The number of professional visitors again exceeded expectation and reached 34,326, a 19 percent growth over last year. PHOTONICS CONGRESS CHINA and other accompanying conferences focusing on industry information and scientific research were well accredited by the audiences.

LEADING COMPANIES ATTEND

Divided into several exhibit segments such as Laser Systems for Production Engineering, Laser and Optronics, Imaging and Optical Metrology, Optics and Optical Manufacturing – the trade show made a big step forward to cover the entire spectrum of the laser and photonics industry on a total exhibition area of 23,000 square meters, increasing by 33 percent. Leading companies from all aspects of the industry, along with national pavilions from Germany, France and Japan, offered visitors the latest products, technologies and industrial applications. Active talks and contented smiles were everywhere during the three-day show. Exhibitors spoke highly of the "best LASER World of PHOTONICS CHINA ever."

Chengying Qin, Marketing Director of HuaGong Laser expressed, "LASER World of PHOTONICS CHINA is a leading event in laser and photonics industry. A lot of top exhibitors gather here and exhibit products covering all areas of the industry."

Over 160 exhibitors joined in LASER World of PHOTONICS CHINA for the first time this year and reaped excellent results. Morever, a special "Laser Systems for Production Engineering" area where more and more laser system equipment has been displayed is organized at the tradeshow. It targets all the laser processing innovations in different areas, the exhibited products including laser cutting, laser marking, laser drilling, laser welding, laser heat processing, laser precision processing, parts precision processing, laser surface processing, laser rapid prototyping, laser carving and others. Lu Chen, Marketing Manager of WUHAN HE said, "It's our first time to exhibit at LASER World of PHOTONICS CHINA. We feel very good at the show where we can meet many peers and competitors. The visitors are very professional with great purchase intention."

USERS SEEKING INNOVATIVE APPLICATIONS

Apart from professional companies from laser and photonics industries, the tradeshow also attracted end users from microelectronics, automotive, photovoltaic, material processing, shipping and aerospace, new energy, education and research and display industries. The tradeshow also attracted visitors from electronica China 2012, productronica China 2012 and Semicon China 2012, which took place concurrently. Guenther Weinmann, General Manager Laser Technology of TRUMPF commented, "TRUMPF met many new customers in different industries such as automotive, solar, shipping, metal processing and consumer electronics, most of which are from China, and we also met customers from Korea, Japan and Singapore." There are also visitors coming from other countries like the U.S., Israel, Hong Kong, Macao and Russia, as was pointed out by many exhibitors.

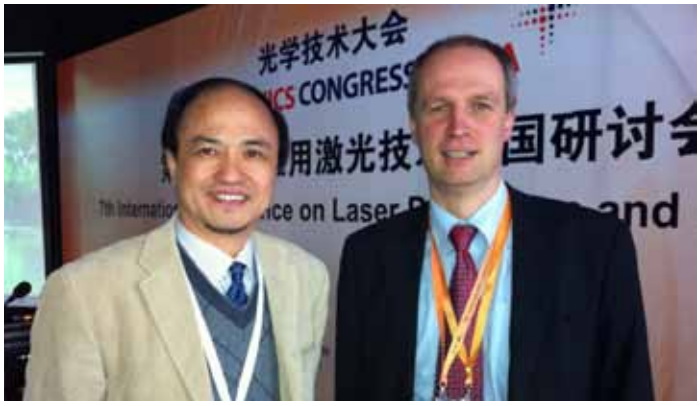
The China Society of Image and Graphics (CSIG), in cooperation with German Industry & Commerce German China Shanghai (AHK) and Messe München International (MMI), the Machine Vision Exhibition Pavilion attracted around 100 exhibitors participating this year, which received many great comments onsite. Jeffrey A. Burnstein, president of advancing VISION +IMAGING (AIA) rated highly of the show, "You can see people from semiconductors, solar energy and other industries, which provides great opportunity for machine vision to going forward." Keith A. Reuben, president of Aisa Pacific, TELEDYNE DALSA said, "We have a very good impression of the show this year. A lot of people coming are really true customers, not people just looking." "The visitor number at our booth is much higher than last year and our visitors are from all over the world," expressed Jianguo He, President of China Daheng Group.

PHOTONICS CONGRESS CHINA

PHOTONICS CONGRESS CHINA was held for the first time during LASER World of PHOTONICS CHINA 2012 and consists of four conferences that cover major topics of the optics and photonics industry. It welcomed 1,266 attendees and featured presentations given by experts and researchers from a host of countries.

At the 7th International Conference on Laser Processes and Components (LPC 2012), Prof. Youliang Wang, Chinese Optical Society Laser Processing Committee, Prof. Andreas Ostendorf,

Ruhr-Universität Bochum, Germany and Prof. Minlin Zhong, Tsinghua University, offered their insights: they presented status and development trends of laser processes, laser processing applications, laser macro processing, laser precision machining and micro processing. A total of 306 attendees crowded the meeting hall during the two days. Prof. Youliang Wang spoke highly of the quality and standard of the conference, "The conference is much better than expectation. The attendee number is the highest ever since. Both its overall organization and the presentation have greatly improved this year. The attendees are getting more and more professional."



Prof. Minlin Zhong and Prof. Andreas Ostendorf

At "Optics Frontier – The 7th Conference on Laser Technology and Optoelectronics" and "Release of 2011 China Optics Outstanding Achievements and Products" advances of today's laser technology were discussed and senior representatives from leading laser companies presented their latest products.

OIDA Optical Fiber Communications Workshop and OSA Energy Photonics Workshop were held for the first time this year. Experts from America, Germany and China gave speeches and hosted panel discussions.

Along with the tradeshow, China (Shanghai) International Machine Vision Technology & Application Conference, Advanced Training Class of Fiber Laser and Training Class on Writing Research Papers for International Research Journals and Conferences won the applause of the audience through the well-chosen topics.

The next LASER World of PHOTONICS CHINA 2013 will be held at Shanghai New International Expo Center on March 19-21, 2013. For more information on LASER World of PHOTONICS CHINA, please contact Sabine Mattern via email smattern@munich-tradefairs.com, or call +1.646.437.1016. ■

CORPORATE MEMBER PROFILE

LASERSTAR TECHNOLOGIES CORPORATION

LIA Corporate Member LaserStar Technologies Corporation is a leading manufacturer of laser welding, laser marking and laser engraving systems. LaserStar Technologies' mission is to enhance the quality, performance and innovation of its laser products, programs and services on a continuing basis.

COMPANY BACKGROUND

Founded in 1957 by Donald G. Gervais and James E. Gervais, LaserStar is headquartered in Riverside, RI but also has locations in Orlando, FL and Pasadena, CA. The company serves all industrial markets and has 60+ employees.

LaserStar Technologies has been manufacturing product, training clients and servicing the worldwide laser marketplace since 1991. Its first products were manual laser welding systems. Over the years, the company has developed a wide range of laser welding and laser marking systems that provide solutions for a number for industries including the medical device marketplace, aerospace and industrial sectors, tool and die job shops, government research facilities, jewelry manufacturers – design studios – retail outlets, dental and orthodontic laboratories and education and prototyping institutions. LaserStar's laser sources and systems enable end-users to accomplish their goals while offering excellent value for their investment.

TODAY'S LINEUP

"At LaserStar Technologies, we have a passion for better ideas. Whether pushing the limits of laser welding and laser marking technology and design or bringing LaserStar users together to share new and innovative laser application concepts, we work to approach every challenge with ingenuity and care," said James Gervais, president and C.O.O. of LaserStar Technologies.

Recently, the company has added the FiberStar Laser Systems – pulse, CW and QCW systems – to its product lineup. LaserStar has seen significant increase in its medical device segment and over the last five years, has seen the largest growth in high pulse-to-pulse stability laser welders.

LaserStar Technologies' laser education courses are designed to provide customers with a solid foundation of fundamental laser welding and laser marking skill sets to immediately gain a revenue impact with a new or existing iWeld, LaserStar or FiberStar laser welding or laser engraving system.

LaserStar Technologies Corporation's fourth generation FiberCube Laser Marking System is just one of the company's portfolio of laser marking sources and systems.

LaserStar Industrial Workstations, one of the company's portfolio of laser welding systems.

With the goal being to enhance the quality, performance and innovation of their laser products, programs and services on a continuing basis, LaserStar invites its customers, employees and friends to be an active participant in this mission.

LaserStar continues to change with industry demand through product introductions and innovations. "We are always responding to the industry/community by cannibalizing our current products every 24-30 months," said Gervais.

Gervais and LaserStar Technologies enjoy being a corporate member of the LIA as they see it as a great way to support the laser community. For more information, visit **www.laserstar.net/**. ■

DISCOVER ALL THE WAYS TO STAY CONNECTED WITH LASERSTAR TECHNOLOGIES

Highlights of the BLS Board of Commissioners Annual Meeting – Meet Your New Commissioners and Officers

In accordance with the BLS Bylaws, two of the three commissioner seats to be filled for the 2012-2015 term were appointed by the LIA Executive Committee, with the remaining seat elected by the board.

The featured CLSO in the February issue of the *BLS News & Review*, **Don Haes, Jr.** currently holds the position of Corporate RSO/LSO at BAE Systems, a defense contractor and laser manufacturer with headquarters in NH. In addition to his work with the BLS, Don is also serving his second term on the Part 2 panel of examiners for the ABHP.

Casey Stack has been involved in commercial laser technology for more than 30 years. He has held posts as a director of the International Laser Display Association (ILDA), as well as a Chair of ILDA's technical standards committee. Today Casey is President of STS Inc./Laser Compliance, an independent laser compliance consultancy based in Phoenix.

Agreeing not only to a second term as commissioner, **Candace Soles** also accepted the position of Secretary/Treasurer. Candy, who is the EH&S manager, and CLSO for Coherent Inc. in Santa Clara, is Secretary of our ASC Z136 standards subcommittee (SSC-9) that is developing the standard for safe use of lasers in manufacturing environments.

With the departure of Ben Edwards from the board, **Sheldon Zimmerman** was elected as chair. As past chair of SSC-4 (responsible for *Recommended Practice for Laser Safety Measurements for Hazard Evaluation*), Sheldon is well known among ASC Z136 members as one who gets the job done efficiently, effectively and expeditiously.

Show your support to the BLS by promoting laser safety education and certification in your facility. If you have any questions about the certification process, contact Barbara Sams at +1.407.380.5833 or email bsams@lasersafety.org. ■

BLS®
Board of Laser Safety

LASER INSIGHTS

Laser Insights is a feature to give insight into the very latest developments in laser safety and the possible applications of laser materials processing. These overviews are designed to give you insight into the content and applications of the papers presented at our conferences and workshops.
*Visit **www.lia.org/laserinsights** to begin your search.*

FEMTOSECOND LASER MICRO-MACHINING OF FUSED SILICA FOR MICROFLUDIC & MICRO-OPTICAL

by Ya Cheng

For both microfluidic and micro-optical applications, fused silica can be an ideal substrate material due to its excellent physical and chemical properties, such as chemical inertness, low thermal expansion coefficient, low autofluorescence, exceptional transmittance over a wide spectral range.

LASER SURFACE TREATMENT AND ADDITIVE MANUFACTURING- BASICS AND APPLICATION EXAMPLES

by Ingomar Kelbassa

Laser surface treatment and additive manufacturing have a strong impact on classical manufacturing and repair tasks addressing markets such as turbo machinery, aeronautics, automotive, off-shore and mining as well as tool, die and mold making and life science. Laser cleaning is an industrially implemented non-contact process providing the possibility to clean dirty and/or rusty surfaces without negative effects resulting from other alternative cleaning processes such as mechanical or chemical cleaning.

INTERNAL BORE LASER CLADDING

by Paul Colby

Bimetallic cylinders are pressure vessels functioning as a component in a system to melt plastics with abrasive additives such as glass and minerals. These vessels have been manufactured the same way since the 1950s. A wider range of cladding materials is available due to not being limited to the melting temperature of the backing material. During conventional centrifugal casting the energy input is external and cladding material must be selected based on the limits of its melting point temperature. ■

View complete articles at www.lia.org/laserinsights under the Featured Category.

JLA UPDATE

The JLA is published four times a year in February, May, August and November. It is available electronically to LIA members as a member benefit. To view the journal online, please make sure your membership is current.

The Laser Institute of America has made its official publication the *Journal of Laser Applications*® (JLA), an online-only journal, complete with new features for a broader audience. JLA is hosted on AIP Publishing's robust Scitation online platform, providing the journal with great functionality and the ability to leverage a wide range of valuable discoverability features. JLA now features nine topic sections, a faster peer-review process and a more functional website (**http://jla.aip.org**) that makes content easier to access and more interactive. Readers will find full-text HTML rendering featuring inline reference links and the ability to enlarge tables and figures by clicking on them. Among the new features are enhanced search functions with more options and better controls to explore returned content in more useful ways.

For non-members of LIA, call the American Institute of Physics at 1.800.344.6902 for subscription information. To receive your JLA table of content e-mail alerts, sign up at **http://lia.aip.org/alerting_services/toc_alerts**.

Research Highlights – Energetic Efficiency of Remote Cutting in Comparison to Conventional Fusion Cutting

The remote cutting technique provides an enormous potential in terms of cutting speeds when working on thin sheets. Even on contour cutting speeds about 100 m/min are realizable. Working without any cutting gas, the material of the cutting kerf must be vaporized partially. It is evident that the energy input must be higher than for pure melting of the cutting kerf's material. In order to characterize laser cutting processes in terms of energetic efficiency, the severance energy can be used. This parameter depends on the necessary laser power to cut a defined sheet thickness at a certain cutting speed. Hitherto, it was used to compare different laser cutting processes using different laser beam sources when cutting straight lines. The target of this paper is to combine the severance energy and the agility in order to compare the remote cutting and the conventional fusion cutting energetically. It will be shown where remote cutting can be applied very efficiently to produce parts in a flexible and highly productive way and what the application area of conventional fusion cutting with fast axis is.

View complete articles at jla.aip.org.

MEMBER INNOVATIONS

NEWPORT EXPANDS ISOSTATION

Newport Corporation, Irvine, CA, has expanded its scientific-grade (SG) series Vision IsoStation vibration isolation workstation. The Vision IsoStation provides advanced performance with more user-friendly features and accessories than other isolation workstations. New features and accessories have been designed specifically to improve ease-of-installation, set-up and lab-space utilization. The Vision IsoStation is offered with scientific-grade optical breadboard platforms in sizes from 24 in. x 24 in. to 36 in. x 72 in. to accommodate applications ranging from small bio-instrumentation isolation, up to medium-sized optical investigations that may have previously needed a full-sized optical table. Visit **www.newport.com/vision-SG** for more information.

SPECTRA-PHYSICS UNVEILS NEW ULTRAFAST LASERS

Spectra-Physics®, Santa Clara, CA, a Newport Corporation brand, recently introduced two ultrafast laser products. The Spitfire® Ace™ Power Amplifier is a high power, ultrafast amplifier with advanced performance and guaranteed stability, and the Inspire IR OPO is an infrared ultrafast optical parametric oscillator (OPO). The Spitfire features industry leading stability with more than twice the output power of the regenerative amplifier only Spitfire Ace, delivering more than 12 W output power at 5 / 10 kHz and more than 10W at 1 kHz repetition rate. The Inspire™ is a fully automated infrared ultrafast OPO for imaging and spectroscopy applications. It tunes gap-free from 1000 to 1600 nm with high power and short pulse widths across the full range. For more information, visit **www.newport.com/ultrafast**.

COHERENT INTRODUCES AMPLIFIER

Coherent, Inc., Santa Clara, CA, has expanded the company's family of Legend ultrafast amplifiers with the launch of the Legend Duo HE+ which delivers over 12 mJ/pulse at 1 kHz repetition rate – by far the highest energy per pulse of any thermoelectrically cooled commercial ultrafast amplifier at this repetition rate. Avoiding the use of cryogenic cooling simplifies operation and maintenance, resulting in lower cost of ownership and higher uptime. In addition, the Legend Duo HE+ is intrinsically more stable than other commercial amplifiers because it uses components and subsystems specifically designed to support Carrier to Envelope Phase (CEP) stabilized operation, the ultrafast technology most sensitive to noise and stability. For more information, visit **www.Coherent.com**.

SPIRICON INTRODUCES BEAMMIC

Spiricon, North Logan, UT, a Newport Corporation brand, has introduced BeamMic™ , a new laser beam analyzer that combines the essentials for beam analysis in a low-cost, entry-level system. BeamMic includes easy-to-use software that measures a beam's size, shape, uniformity and mode content. Beam intensity profiles are displayed simultaneously in 2D and 3D. Statistical analyses can be performed on measurement functions and min/max limits can be set for pass/fail testing. Results are logged and can be exported to industry standard formats. For more information, visit **www.ophiropt.com/photonics**. ■

WELCOME NEW CORPORATE MEMBERS

Pat Technology Systems, Inc.
Veudrevil-Dorion, QC

ULO Optics, Inc.
Los Gatos, CA

For a complete list of corporate members, visit our corporate directory at **www.lia.org/membership**.

MEMBERS IN MOTION

FRAUNHOFER ILT WINS AWARD

A team from the Fraunhofer Institute for Laser Technology ILT has won the 2012 Innovation Challenge in the category "Power and Propulsion" for its additive manufacturing process of BLISKs from the American magazine *Aviation Week*. Representing the team, Dr. Ingomar Kelbassa and Johannes Witzel received the award in Washington, D.C. in March. BLISKs are important components for aircraft engine and turbine construction, consisting of disks with integrated compressor blades. Within the Fraunhofer Cluster for Innovation "TurPro" – in cooperation with Rolls-Royce Deutschland Ltd & Co KG as well as in partnership with the Fraunhofer IPT – the Fraunhofer ILT has developed a laser-based process that preserves resources during manufacture and maintenance of BLISKs. Visit **www.ilt.fraunhofer.de** for more information.

OPHIR-SPIRICON HONORED

The Cache Chamber of Commerce recently honored Ophir-Spiricon, a Newport Corporation brand, as Outstanding Technology Business of the Year.

Spiricon develops the technology that is behind many of today's laser-based innovations. Spiricon was founded in 1978 by Dr. Carlos Roundy, a Logan native. Roundy got his Ph.D. from Stanford and worked for Bell Labs. While at Bell Labs, he invented a way to make 2D images from heat; this is now known as a pyroelectric infrared camera.

"Most major laser manufacturers rely on Spiricon's fundamental technology to assist them in developing today's innovations in lasers and laser-based devices," stated Ophir-Spiricon President Gary Wagner. "In the last five years we have more than doubled our size to 58 employees, quadrupled our revenue to $21 million and in 2011 moved into a new 18,000-square-foot facility in North Logan."

THE NEW ANSI Z136.8

The ANSI Z136.8 standard – LIA's latest offering in a range of vital resources for laser personnel — arose from the increasing reliance on lasers in labs and other research-designated areas. *American National Standard for Safe Use of Lasers in Research, Development, or Testing*, the title of the new ANSI Z136.8 standard, also addresses injury prevention in specific areas where experiments are conducted. This new standard geared to lasers employed in research takes a "more realistic" approach to guiding safety officers overseeing such work, in which the use of customized laser devices and fiber optics is common.

Highlights of this standard include guidance on export controls, the use of warning signs, inclusion of sample audit forms for labs and program reviews and deletion of some CDRH-based control measures. Z136.8 further distinguishes itself from the parent ANSI Z136.1 document by detailing two additional hazard analysis areas — beam path and beam interaction and summarizing proper procedure in unrestricted, restricted, controlled, exclusion and inaccessible locations. To order the Z136.8 ($140 for LIA members, $160 for nonmembers), visit **www.lia.org/ANSI** or call LIA at 1.800.34.LASER.

ICALEO 2012 ADVANCE PROGRAM AVAILABLE

The Advance Program for the International Congress on Applications of Lasers & Electro-Optics (ICALEO®), which has a 30-year history as the conference where researchers and end-users meet to review the state-of-the-art in laser materials processing, laser microprocessing and nanomanufacturing, as well as predict where the future will lead, is now available. Registration for ICALEO, which will be held Sept. 23-27, 2012 in Anaheim, CA, is also now open. Some of this year's featured sessions are diode lasers for processing and pumping, laser process monitoring and control, laser processing of biological materials, laser hybrid processing, laser manufacturing for alternative energy sources and laser business development.

ICALEO
31st INTERNATIONAL CONGRESS ON APPLICATIONS OF LASERS & ELECTRO-OPTICS

ICALEO offers various level sponsorship opportunities to help create a lasting impression with attendees. Sponsors are acknowledged in a number of ways ranging from onsite signage to visibility on our ICALEO website. From general refreshments to receptions, ICALEO can highlight your company both online and onsite! Find a sponsorship that best fits your company's strategy and needs. Visit **www.icaleo.org** for more information, or contact Jim Naugle at jnaugle@lia.org, 1.800.34.LASER.

SAVE THE DATE FOR LME 2012

LME™ 2012 will be held in Schaumburg, IL, Oct. 23-24 and will be the place to see the latest in laser technology, network with the industry's elite and find solutions to current and future manufacturing needs. The mission of LIA's Lasers for Manufacturing Event (LME) is to provide a one-stop event for companies interested in integrating laser technology into their production. Attendees will learn about laser choices, beam delivery, automation equipment, safety considerations, applications development and meet exhibitors that supply these products and services.

There is still time to sign your company up as an exhibitor or sponsor of this one-of-a-kind event. A variety of levels are available. Visit **www.laserevent.org** for more information or contact Jim Naugle at jnaugle@lia.org, 1.800.34.LASER.

LME™ 2012
LASERS FOR MANUFACTURING EVENT™

LASER WELDING & JOINING WORKSHOP

Join us in Schaumburg, IL, Oct. 23-24 at LIA's Laser Welding & Joining Workshop to learn from industry specialists from around the world about applying laser materials joining technologies to today's manufacturing challenges and opportunities. This workshop will offer quality technical sessions and networking opportunities to discuss equipment and applications with top laser industry leaders. Those that will be attending are manufacturing engineers and managers, product designers, process/R&D engineers, applications engineers, business developers and entrepreneurs, plant supervisors and anyone interested in laser materials joining technology (welding, joining or brazing).

LASER WELDING & JOINING WORKSHOP

There are sponsorship opportunities available for companies looking for that special niche market that this workshop represents. Call 1.800.34.LASER for more information or visit **www.lia.org/laserwelding** to choose your level.

ILSC COMING IN 2013

Make plans now to be in Orlando, FL March 18-21 in order to attend the 2013 International Laser Safety Conference (ILSC®). ILSC is a comprehensive four-day conference covering all aspects of laser safety practice and hazard control. Scientific sessions will address developments in regulatory, mandatory and voluntary safety standards for laser products and for laser use. The Practical Applications Seminars (PAS) complement the Scientific Sessions by exploring everyday scenarios that the laser safety officer and medical laser safety officer may encounter. Professionals in all fields and applications will find ILSC 2013 a tremendous source for information and networking opportunities.

ILSC®
INTERNATIONAL LASER SAFETY CONFERENCE

Sponsorship of ILSC 2013 is a valuable way to reach a highly-qualified target audience. Communicate directly with influential decision makers and promote brand recognition to your target market with our exclusive packages. For more information, visit **www.lia.org/ilsc** or contact Jim Naugle at jnaugle@lia.org, 1.800.34.LASER. ■

Laser Institute of America
Laser Applications and Safety

13501 Ingenuity Dr., Suite 128
Orlando, FL 32826

ANSI Z136.3

2011 SAFE USE OF LASERS IN HEALTH CARE

REVISED DOCUMENT ADDRESSES:

- New Wavelengths
- Audit Requirements & Procedures
- Management Model for Diverse Use
- Safety Concepts/Personnel Responsibilities
- Lasers for Home Use
- LSO's Role in Rental Services
- Sample Forms

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