



THE OFFICIAL NEWSLETTER OF THE LASER INSTITUTE OF AMERICA

LIA TODAY

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**ILSC 2013: EXPERIENCE THE
WORLD'S LEADING LASER
SAFETY CONFERENCE**

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**EXPONENTIAL GROWTH OF
MEDICAL LASER APPLICATIONS
IN THE U.S.**

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**MEET THE NEW PRESIDENT AND
BOARD OF DIRECTORS**

PG 12

FOCUS:

Medical
Applications

Laser Institute of America is the international society dedicated to fostering lasers, laser applications and laser safety worldwide.

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**Laser Institute
of America**

Laser Applications and Safety

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LIA TODAY

THE OFFICIAL NEWSLETTER OF THE
LASER INSTITUTE OF AMERICA

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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.

CALENDAR OF EVENTS

Laser Safety Officer Training

Jun. 25-27, 2013 Indianapolis, IN

Dec. 3-5, 2013 Orlando, FL

Laser Safety Officer with Hazard Analysis*

Mar. 11-15, 2013 Phoenix, AZ

Jun. 10-14, 2013 Niagara Falls, NY

Oct. 7-11, 2013 Miami, FL

Nov. 4-8, 2013 Los Angeles, CA

*Certified Laser Safety Officer exam offered after the course.

Laser Safety Officer for R&D

Mar. 13-15, 2013 Orlando, FL

Medical Laser Safety Officer Training*

Mar. 2-3, 2013 San Diego, CA

Mar. 16-17, 2013 Orlando, FL

*Certified Medical Laser Safety Officer exam offered after the course.

Medical Laser Safety Officer for
Dermatology Nurse Practitioners

May 14, 2013 Clearwater Beach, FL

International Laser Safety Conference (ILSC®)

Mar. 18-21, 2013 Orlando, FL

International Congress on Applications of
Lasers & Electro-Optics (ICALEO®)

Oct. 6-10, 2013 Miami, FL

Lasers for Manufacturing Event (LME®)

Sept. 11-12, 2013 Schaumburg, IL

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

LASER SAFETY



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PRESIDENT'S MESSAGE



Dear LIA members and readers of the *LIA TODAY*,

As this year's president of LIA, first of all I would like to say thank you to Reinhart Poprawe for all his ideas, discussions and effort he has put into LIA during his term serving as the president in 2012. My goal is to step into his footsteps to continue the growth and development of LIA through 2013.

What is the outlook for 2013? There are always mixed feelings on the first of the year, what will happen this coming year? If we look at the mega trends, the growing and aging population will be an important task for all of us to solve. We all, with creativity and the laser as a tool, can take our share on solving some of these challenges. This issue will give an overview on medical laser applications. Many lives have been saved with laser processed medical implants, surgical tools and even with laser direct treatments. It is LIA's task to ensure the safe use of lasers. A preview of the 2013 International Laser Safety Conference (ILSC®) is also featured in this issue. 2013 as an uneven year, the most important exhibition in our field "LASER World of PHOTONICS" will take place in May in Munich. *LIA TODAY* will cover this show with a preview. Many laser companies will use this show to show "world premiers" of new and exciting products. Lasers with unique specifications concerning wavelength, pulse duration and pulse frequency and average power are supposed to hit the floor. These new tools will offer new ways of processing material for the future.

Despite the €-crises in Europe, the negative trade balance in the U.S. and the possible slowdown in the economic growth in China, the laser has the potential to ensure growth with new applications in 2013.

I wish you health, great ideas, success in your business and hope to see you at one of the LIA events in 2013.

Yours,

Klaus Löffler, President
Laser Institute of America

EXECUTIVE DIRECTOR'S MESSAGE



First, my compliments to LIA's Marketing Director and *LIA TODAY* Publisher Jim Naugle for the beautiful, clean, "New Look" *LIA TODAY*. In addition to the new look, the content of our newsletter is constantly improving and we hope that this provides an increasing benefit to you, our members. Of course, if you have any recommendations on things you would like to see in *LIA TODAY*, please contact Jim or me.

Looking back at 2012, it was a very good year for Team LIA. Together we held successful conferences and workshops, and added a new workshop on laser welding and joining. We revised and updated some of our laser safety standards and developed a new one covering safety in research. Our safety course attendance continues to grow and we added a safety course for researchers based on the new standard. In addition, we developed a new online course for operators and technicians.

This dedication to carrying out our mission has brought us financial success. Although our fiscal year does not end until March 31, 2013, we are ahead of projection and expect to end the year in good shape.

As you all know, the key to our success is good leadership from our Board, Officers and President. Our 2012 President, Reinhart Poprawe, challenged us to keep improving and provided wise guidance and enthusiastic support to help us achieve our goals. In addition to his presidential duties, Reinhart is Editor-in-Chief of the *Journal of Laser Applications*®, where he is patiently laboring with his team of editors to continue improving the scope and quality of our journal.

From a personal point of view, it has been an education and a pleasure to work with the good professor for the benefit of LIA. The fact that we have also built a strong friendship is a huge fringe benefit and one of the reasons I love my job.

We are blessed again in 2013 with another successful leader - Klaus Löffler, as president. Klaus has been a big supporter of LIA and a personal friend for over a decade now, serving two spells on the Executive Committee of our Board. During his time as secretary, Klaus was justly famous for his speed in producing the minutes, sometimes producing them just as the meeting finished. Welcome Klaus, we look forward to working more closely with you this year.

I am excited to tell you about our latest initiative, "Laser U." This is the home of our new series of online courses covering laser manufacturing and materials processing. The initial content was recorded at our Lasers for Manufacturing Event (LME®), with more to come. For more information, check out the "LIA Announces" section on page 30.

Finally, my heartfelt good wishes to everyone for a healthy, happy and successful 2013!

Peter Baker, Executive Director
Laser Institute of America

ILSC 2013: EXPERIENCE THE WORLD'S LEADING LASER SAFETY CONFERENCE

By Geoff Giordano

For four days in March, the Laser Institute of America's International Laser Safety Conference (ILSC®) in Orlando will be abuzz with a stellar educational program featuring recognized laser safety experts from around the world.

With scientific sessions tailored specifically to everyone from Laser Safety Officers (LSOs) to medical technicians to laser physicists, engineers and safety product manufacturers, ILSC 2013 will feature cutting-edge presentations from some of the biggest names in laser safety.

The conference, to be held March 18-21 at the Doubletree by Hilton® at the entrance to Universal Orlando Resort®, will be packed wall to wall with the latest information on hazard evaluation and risk assessment, eye protection, non-beam hazards, high-power lasers, medical applications, bioeffects and more.

Among the featured session chairs and speakers will be veteran LIA safety educators Dr. David Sliney, and Ken Barat, chairman of the standards subcommittee that crafted the new ANSI Z136.8 *Safe Use of Lasers in Research, Development, or Testing* standard.

With the revision of the parent Z136.1 underway, "the laser safety professional needs to understand where his or her program fits into the new standardization," says Dr. Ben Rockwell, four-time chair of ILSC and chairman of the subcommittee that produces the ANSI Z136.1 standard. "They will learn those kinds of things at ILSC," which this year expands on the popular Technical and Medical Practical Applications Seminars (PAS).

This year, the two-day Medical PAS will offer contact hours for attendees. Chaired by Vangie Dennis, administrative director for the Spivey Station Surgery Center outside Atlanta, the Medical PAS will feature an overview of the Association of periOperative Registered Nurses (AORN) Recommended Practices for Laser Safety.

"We have some dynamic speakers this year and great topics that will enhance the knowledge of the advanced practitioners, as well as anyone who is new with medical lasers," Dennis explains. "A lot of the information involves changes in recommendations and new technology. We also will give a perspective on how to handle ethical dilemmas as a medical LSO. This is not always black and white, as it is with industry, because of the patient variables." Topics addressed in the Medical PAS will include an update on surgical plume management, airway fires, electrical safety in the laser use area, teamwork in the operating room, legal issues with lasers in health care and current practices in the use of lasers in aesthetics.

Meanwhile, the two-day Technical PAS will "provide a forum for institutional laser safety professionals to share real-world lessons on managing site laser safety programs in a variety of settings," says Chair Ben Edwards, radiation safety officer at Vanderbilt University. "These expositions offer the collected wisdom from the study of actual laser accidents, years of first-hand laser use research and laser lab design — revealing valuable observations that accrue only with the benefit of experience and hindsight. Other presentations will give LSOs practical knowledge on performing hazard calculations, identifying and complying with the applicable regulations and standards, understanding how optics change the nominal hazard zone and more."

A UNIQUE EVENT GETS BETTER

Having participated in ILSC in various capacities for nearly two decades, "I truly never saw such a wealth and quality of submissions, which made it a pleasure to arrange them into a range of thrilling sessions," enthuses Laser Safety Scientific Sessions Chairperson Dr. Karl Schulmeister of Austria's Seibersdorf Laboratories.

WE ARE EXTREMELY STRONG IN PRODUCT SAFETY AND PRODUCT STANDARDS-RELATED ISSUES, AS WELL AS TWO BIOEFFECT SESSIONS.

For the first time, Schulmeister says, ILSC will feature a special session on visual effects like glare and dazzle. Also new is a poster gallery, and returning by popular demand is a scientific medical safety session.

Those features bolster an already one-of-a-kind event spearheaded by the top minds at the cutting-edge of setting the guidelines for laser safety. Chief among those experts is General Chair Rockwell, who works at the Air Force Research Laboratory in San Antonio, Texas.

"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. 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,



“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 help to write.”

WHY ILSC IS THE PLACE TO BE

For Yoav Grauer, system engineer and electro-optics development leader with BrightWay Vision in Haifa, Israel, ILSC is “a great platform to expose our technology, share our laser safety approach and hopefully meet relevant professionals in this field to assist with our laser safety efforts.” BrightWay is developing an advanced night system for forward-facing driver safety assistance, based on an active gated-imaging technology, Grauer says. He is responsible for laser safety design, analysis and certification.



Myung Chul Jo, a certified LSO at the University of Nevada, Reno, concurs that ILSC provides valuable industry insights and networking opportunities with his peers. Managing the safe use of lasers on campus “requires having the knowledge and ability to make decisions” because “there is often no one to turn to when there are questions. Having colleagues is very important.”

ILSC “has provided me with many opportunities to meet experts from all over the world, learn from the experience of others and learn about new technologies and upcoming new standards,” he says. “Laser safety is a very specialized field and laser safety professionals are few in number.” When he began his duties as LSO more than 15 years ago, “it was challenging to start a new laser safety program. Attending ILSC has been very helpful in assisting me to successfully meet the challenge.”

That’s because ILSC’s scientific sessions are carefully crafted so those with laser safety responsibilities, whether novice or

experienced, are exposed to “immediately useful tools for improving competence, confidence, compliance, training material, efficiency and, above all, safety,” Edwards says.

And four social functions — the welcome and sponsor receptions and the hot topic and awards luncheons — are designed to help attendees reinforce what they’re learning.

As lasers grow smaller, cheaper and more powerful, and various industries embrace photonics for more and more applications, ILSC has many lessons to impart. “Today we are confronted with extremely compact — sometimes even portable — and often inexpensive lasers that are nonetheless extremely powerful and quite dangerous,” Edwards cautions.

“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.”

A GREAT PLATFORM TO EXPOSE OUR TECHNOLOGY, SHARE OUR LASER SAFETY APPROACH AND HOPEFULLY MEET RELEVANT PROFESSIONALS IN THIS FIELD TO ASSIST WITH OUR LASER SAFETY EFFORTS.

In the research setting, “you’re often dealing with lasers that don’t have all the bells and whistles,” notes Barat, former Laser Safety Officer at Lawrence Berkeley National Laboratory. Many are homemade. “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 discuss eyewear use. But research settings are more fluid. In R&D, a setup can stay the same with just different samples for years or change every few weeks following the path of the results or funding.” ■

For more information about registering to attend ILSC or to examine the program schedule, visit www.lia.org/ilsc.

EXPONENTIAL GROWTH OF MEDICAL LASER APPLICATIONS IN THE U.S.

By Geoff Giordano

At the second annual Lasers for Manufacturing Event (LME®) in October, past LIA President David Belforte gave a riveting account of some of the more economically robust segments of the laser industry. Ultimately, it was the medical sector that “kept us alive through the recession,” he asserted.

Laser applications in the manufacture of stents, catheters and implantable devices “continue to grow,” Belforte said, noting the value of their respective niches.

For instance, “Stent cutting is one of the major success stories in laser precision cutting, going back 25 years,” he said. “As stents are getting more and more sophisticated, they have to be processed by lasers, and lasers are doing well every single year in expanding this particular market,” which he says is worth \$2.8 billion in the U.S.

Meanwhile, in the \$11.5 billion catheter market in the U.S., most makers use lasers in various assembly functions, including marking, drilling and welding balloons onto the devices. Even bigger is the U.S. market for implantable devices, where lasers play a vital role in the production of drug-delivery units, pacemakers and defibrillators — the latter a \$106 billion sector.

A survey of some key players in these areas substantiates Belforte’s assertions that lasers will continue to offer a profitable avenue for contract manufacturers.

STENTS

Laserage in Waukegan, IL, has been doing precision tube processing since 1997, according to Dan Capp, vice president of sales development. Since the Great Recession of 2008, the firm has grown from about eight precision tube cutters to 15, he says.

“Laserage is a production organization, but we’re also a prototyping organization,” Capp explains. “We do tons of prototypes. Engineers from all kinds of companies — big OEMs as well as startup companies — send us drawings daily. We (are receiving) well over 5,000 different designs for implant scaffolds and producing anywhere from two to millions of their designs.”

In terms of materials Laserage can process, “our forte would be nickel titanium components; however, we process lots of stainless steel, cobalt chrome and many other alloys that people send in — the other alloys in much smaller volumes, of course. We are also in the realm of bioabsorbable materials,” both plastic and metal.

Laserage offers its clients a variety of capabilities depending on

the application. “If we were talking about a really thick-walled tube — say a half a millimeter or more — depending on the design, a disc laser can approach that requirement very well,” Capp says. A lot depends on how densely packed the laser cuts are.

In the meantime, “if we’re talking about a really small diameter tube and heat effect is going to be a problem when it comes to putting a fiber or a YAG laser on this tube — there are lots of little cutouts but the tube’s only a fraction of a millimeter in diameter — we would approach that with an ultrafast pulsed laser.” In that instance, “there’s not any room to do post-processing. If we put heat into it, we’re going to change the metallurgy of the tube. What comes out is a part ready to finish.”

While medical products come in and out of favor, affecting the growth curve for shops like Laserage, the future grows brighter with each advance in ultrafast lasers. “No-heat processing (is) going to continue to develop, and that will be required more and more as parts get smaller,” Capp asserts. “I would expect the guys out there developing lasers to focus on this area — make the lasers more productive, make the cost of running lasers come down and the cost to purchase the lasers come down. There are going to be more and more applications that use that type of laser processing.”

CATHETERS

At PhotoMachining in Pelham, NH, founder and CEO Ron Schaeffer says “we had some of our best years in 2008, 2009, because we were heavily entrenched in the medical device market.”

Over the years, he says, “we’ve seen all kinds of things for catheters; we’ve seen lasers being used for tipping applications (and) what we primarily do, drill holes in them for drug delivery. We’ve seen all kinds of other things, too. There’s a lot of welding involved within the catheters. We do the ablation: hole cutting, drilling, slicing, tipping.”

At present, he says, about half of all the disposable medical devices used worldwide are made in the U.S. “The corollary is that approximately 50 percent of that is outsourced to smaller companies. So you get the big guys — the Johnson & Johnsons, the C.R. Bards, the Boston Scientifics — shopping out a lot of work to companies like ours.”

That means the medical device industry “can be highly profitable, and it can be high volume. And it’s sustaining.” After all the upfront engineering, capital expenditure and regulatory hurdles, a product embraced long-term can be quite lucrative. “And if you’re working with the company from the beginning,



you are locked in as a vendor because larger companies don't want to have to go out and qualify a whole bunch of vendors if they don't need to. They're usually going to qualify at least another one so they have a backup. But as long as you're the prime vendor and you are not screwing up, you are probably going to continue to get that business."

Schaeffer, like Capp, is excited about the prospects of ultrashort-pulse lasers. About 15 years ago, when PhotoMachining opened for business, the firm looked to diode-pumped solid state lasers to replace UV excimer units. Now, with picosecond and femtosecond devices, "the pulse length is so short you can get really good processing quality" without UV lasers.

The importance of processing quality in the medical device field can't be stressed enough. As Schaeffer relates, lasers fill the bill with ease. "We have a big customer, and we built about a dozen systems for them for marking catheters," he begins. "You want to stick these catheters in a body and you want to know how far you're sticking them in, so you mark graduations on them. This could be done with printing, but a lot of times the inks do not stick very well to some of these plastics.

"Our customer initially was using a YAG laser to mark these parts. The marks looked good to the eye — very high contrast — but if you looked at them up close, you could see that they were burned in, which you would expect from an infrared laser. You could run your hand over it and feel the mark — and where they stick these things you don't really want to be feeling (imperfections). We came in with a UV laser, which just marks the surface, doesn't impart any heat (and creates) an indelible mark. You can't feel it."

IMPLANTABLE DEVICES

Steve Weiss, one of the primary owners of Innovative Laser Technologies (ILT) in Minneapolis, MN, echoes the importance of the quality of lasers and ILT systems bring to the table — especially the operating table.

"One of our customers communicated to us recently that a doctor in an operating room will look at that (implantable) device, and if that laser weld doesn't look good, he won't hesitate a second to set that device aside and grab another one — one that might even be a competitor's device — even though it costs tens of thousands of dollars."

ILT, founded in 1998, benefits by being in the backyard of many medical device firms. "We have had pretty much continual growth since then," he says, largely due to the firm's emphasis on being a laser integrator. By employing a broad variety of lasers — including Nd-YAG, fiber and more recently ultrafast

— in various wavelengths and powers, "we continue to grow technically and as a business."

While ILT's decades of in-house laser systems experience for the implantable medical market has contributed to yet another record year in 2012, the burdens of Obamacare's tax on medical device manufacturers presents a significant unknown to the market's future. But as Baby Boomers age — "there are approximately 10,000 people a day turning 65" — the demand for laser-based hermetic welding of drug pumps, defibrillators, neurostimulators and other devices that enhance quality of life seems unending. Those units also require laser-based welding of sub-assembly components such as batteries, capacitors and leads.

"A lot of what has been developed over the years assists our customers in meeting the needs of the medical implantable device market with process control, process monitoring and part-to-part traceability to help take the operator variability out of the process and make it more repeatable," Weiss explains. For example, "the processes developed and qualified by the customer for a laser weld need to meet a strict set of requirements. ILT developed systems provide the necessary functionality so if that process deviates from those required parameters, we stop and raise a flag."

In short, the principals at ILT, PhotoMachining and Laserage are unanimous in their confidence that the use of lasers to produce high-quality, high-value medical components is sure to remain a profitable enterprise.

As more opportunities for laser-based manufacture present themselves in the medical sector, training laser operators is paramount. Toward that end, the Laser Institute of America continues to expand its safety resources, from the ANSI Z136 standards to an always-evolving range of classroom and online courses. View the full range of LIA's educational materials online at www.lia.org/store. ■

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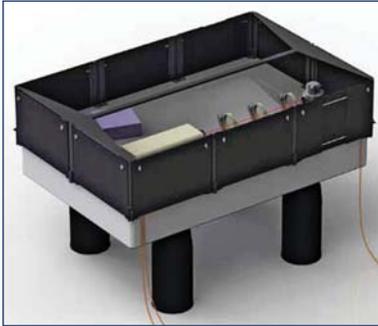
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MEET THE NEW PRESIDENT AND BOARD OF DIRECTORS



KLAUS LÖFFLER, LIA's 2013 president, graduated from the University of Stuttgart with a master's in mechanical engineering. His expertise in lasers extends from resonator design, excitation methods, beam delivery, sensor systems to laser material processing. From 1990 to 1991 he worked on the LaserCAV process at MAHO in Pfronten, Germany. From 1991 to 1995 he worked at TRUMPF Laser Technik in Ditzingen, Germany as a CO₂ development engineer. In 1995, he came to TRUMPF Inc. in Farmington, CT, USA. He worked as technical coordinator between TRUMPF in Germany and TRUMPF Inc. to transfer technology and build up technical staff. From 1996 to 2002 he started the TRUMPF Laser Technology Center in Plymouth, MI, USA. In his position as director, he was responsible for the organization, mainly focused in support and sales of all TRUMPF laser products. During this time more than 500 TRUMPF lasers were implemented in North America. From 2002 to 2006 he took over the position as manager of the joining group at Volkswagen. In this position he was responsible for the implementation of more than 500 High Power Lasers into production. This included the application as well as the industrial implementation.

From 2006 to the end of 2009 he took over the responsibility for international sales at TRUMPF Lasers and Systems along with the responsibility for sales, additional product management, main application management and marketing. From 2009 to 2010 he implemented the strategic industry development for the TRUMPF Laser und Systemtechnik. In 2011 he was promoted to the Head of International Sales for TRUMPF Laser. Starting in 2007, he became a member of the Board of Directors of the Laser Institute of America. In 2008 he was elected as Secretary of the Executive Committee of LIA. Besides LIA, he serves on the advisory board of the Fraunhofer IWU, Bavarian Laser Center, School of Advanced Optical Technology and the exhibition of LASYS. Mr. Löffler also acts as an editor for *JLA*. The global growth of laser technology is the goal of all of these activities.

During his term as LIA president, Löffler would like to ensure the growth pattern from the previous years and take measures that ensure a stable growth for years to come. He has a lot of ideas and his goal is to implement as many as possible and have a measurable positive result at the end of 2013 with the help of the dedicated LIA members and staff.

One of Löffler's goals is to continue to support immediate past president Reinhart Poprawe's hard work in the positive development of LIA's *Journal of Laser Applications*® (*JLA*) by encouraging more creative attention and input within the organization itself.

Löffler would also like to put measures in place to increase LIA's brand awareness. Cooperation has already been established between LIA and a graduate program based in Germany, to increase the reach

of LIA. If it develops well, he would like to see similar cooperations like this one increase internationally. Löffler does not want to just look at countries far away, he would also like to take a closer look into other American countries like Mexico, Canada, Brazil, etc. and how LIA could serve their needs in order to increase presence and gain new memberships. Within the U.S., the government initiative "Harnessing Light" offers a chance for LIA to take a leading role and further increase LIA's brand awareness.

On a personal note, Löffler is passionate about two main things in life – being outdoors and spending time with his family. He is married and has three little girls. For those who know him, his favorite outdoor activity is running and he has been a member of the German National Team. Löffler is also the founder and advocate of the unofficial ICALEO® morning running club, now called the "LIA Running Club," and hopes to gain more recruits this year. We wish Klaus Löffler success in all of his endeavors as this year's LIA president!



PRESIDENT-ELECT YONGFENG LU

is currently the Lott University Professor of Electrical Engineering at the University of Nebraska - Lincoln. Before he joined UNL in 2002, he worked at the National University of Singapore. Dr. Lu received his BEng degree from Tsinghua University (China), M.Sc. and Ph.D. degrees from Osaka University (Japan) in 1984, 1988 and 1991, respectively. He has approximately 20 years of research

experience in laser-based micro/nanoscale materials processing and characterization. Besides the fundamental research work that led to a large number of publications and a number of national and international awards, he also has successfully developed a number of laser-based material processing technologies and commercialized them in industries. In the past few years, he received more than \$10 million of research funding from DoD, NSF, DOE, NRI, private foundations and industry, including a MURI grant from ONR. He has given numerous plenary, keynote and invited talks in international conferences. He has served as the general chair for the International Congress on Applications of Lasers and Electro-Optics (ICALEO) in 2007 and 2008, which is the largest annual event organized by the Laser Institute of America. He was elected to SPIE and LIA Fellow since 2008 and 2009, respectively. He is also an editor for the *Journal of Laser Applications*.



TREASURER STEPHEN CAPP is CEO of Laserage Technology Corporation, where he has held that position since 1994. He previously held positions as Plant Manager and Vice President of Operations. Laserage is an international supplier of laser-processed materials growing to one of the largest laser job shops in the United States. Mr. Capp graduated from Milwaukee School of

Engineering in 1978 with degrees in Electrical Power Engineering Technology and Industrial Management and has worked in the laser industry for more than 25 years. He has been a member of the LIA since 1992. He has also served three previous terms as the national treasurer and member of the Executive Council of the International Microelectronics and Packaging Society. With his prior experience, he will assist the Executive Director and the members of the Board of Directors in setting the direction and addressing financial issues of the LIA.



SECRETARY ROBERT J. THOMAS

received his B.S. degree in physics from Pittsburg State University, Pittsburg, KS in 1989 and his Ph.D. in Physics from the University of Missouri – Columbia in 1994. In 1994, he joined the Air Force Research Laboratory in San Antonio, TX. For the past 17 years he has been a national leader in the areas of experimental and theoretical biomedical optics — particularly those areas

that apply to the establishment of safety standards and exposure limits. Dr. Thomas is a member of SPIE, the American Physical Society (APS), the Directed Energy Professional Society (DEPS), the Institute of Electrical and Electronics Engineers (IEEE) and in 2007, was named a Fellow of the LIA. Thomas' contributions to the LIA have primarily involved basic research for the scientific foundations of laser safety and the development of the ANSI Z136 series of standards. Thomas' contributions have led to his role as the Secretary of the ASC Z136 from 2005-2010, and in 2010, appointment as the chairman for the ASC Z136.



IMMEDIATE PAST PRESIDENT REINHART POPRAWE

has worked in the laser industry and its related organizations for over 30 years. He received an M.A. in physics from California State University in Fresno in 1977. After completion of his Ph.D. in physics (Darmstadt, 1984) he joined the Fraunhofer Institute for Laser Technology (ILT) in Aachen, Germany where he worked as head of a department for laser-oriented

process development. Prof. Poprawe started Thyssen Laser Technik GMBH in 1988 and was the company's CEO. Since 1996, he has been managing director of Fraunhofer ILT and holds the University Chair for Laser Technology at the RWTH Aachen. In 2004 he served as vice rector of Aachen University and currently is a member of several boards in the scientific and industrial organizations, e.g. the AKL Arbeitskreis Lasertechnik e. V. Aachen. He also chairs the RWTH International Board and is the Rectors delegate for China.

2013-2015 BOARD OF DIRECTORS



PAUL DENNEY has been involved in the development and implementation of laser materials processing for over 30 years. Presently he is a Senior Laser Applications Engineer at Lincoln Electric in Cleveland, OH. Previously he held the positions of director of the Laser Applications Laboratory at the Connecticut Center for Advanced Technology (CCAT), laser technology team leader at the Edison Welding Institute (EWI), head of the

High Energy Processing Department at ARL Penn State, research engineer at the Westinghouse Electric Research & Development Center in Pittsburgh, metallurgist at the Naval Research Laboratory (NRL), Washington, DC and a product metallurgist at C F & I Steel Corp. in Pueblo, CO. He is a Fellow of LIA and has been General Chair and the Laser Materials Processing chairperson a number of times for ICALEO as well as Laser Additive Manufacturing (LAM®) Workshop Chair the last four years. In addition to LIA, he is also a member of ASM and AWS having participated in C7, C7C and C7D committees on high power density processes.



LARRY DOSSER received his B.S. in chemistry (1966) and M.S. (1970) in physical chemistry from Michigan State University, and a Ph.D. in physical chemistry from the University of Arkansas (1975). This was followed by postdoctoral appointments at the University of Toronto (1975-1978) and Syracuse (1978-1980). Dr. Dosser was employed at the DOE Mound Facility (1980-1995) located in Miamisburg, OH. He founded

the Mound Laser & Photonics Center, Inc. (MLPC) in 1995 and serves as its President and CEO. Dosser possesses a broad spectrum of more than 40 years of hands on experience in laser applications and physical chemistry with proven success in numerous laser-based technology areas. He has guided the company to consistent profitability and growth following a strategy that combines commercial laser-based manufacturing services with successful R&D programs funded by the Federal government, the State of Ohio and corporate America. He is an active member of several educational and commercial development boards and works to promote STEM education and enhance the collaboration between defense, commercial and educational institutions.



STEFAN HEINEMANN has been involved with the development of new laser processes, components and systems for over 20 years, primarily serving the automotive and the renewable energy industry, i.e., batteries and solar cells. He received his diploma from the Technical University of Munich in 1991 and his Ph.D. in electrical engineering from the Technical University of Berlin in 1994 working on tunable single frequency

disk lasers and applying MEMS technologies for their cost effective production. Dr. Heinemann joined the development team of Jenoptik Laserdiode GmbH in 1994. In 1998 he joined Fraunhofer USA as the director of the Center for Laser Technology, taught at Wayne State University from 1999 to 2001 and co-founded three Michigan based companies. In 2007 he established the cooperation between the University of Michigan and Fraunhofer Gesellschaft in the field of Clean Transportation. He is also a member of the American Welding Society (AWS).



STEFAN KAIERLE studied in the field of electrical engineering and went on to earn his Ph.D. in mechanical engineering at RWTH Aachen University, Germany. In 1998 he joined Fraunhofer ILT as a department head for system technology. In this role, his main research was focused on laser system technology, laser materials processing, laser process control and optics, as well as related fields like eco-efficiency,

automation and laser engineering. He had been appointed to two guest professorships at Changchun University (in 2005) and at Beijing University of Technology (in 2007), China. In 2012, Dr. Kaierle moved to Laser Zentrum Hannover (LZH) and assumed responsibility for the department of Materials and Processes. Currently, he is President of the European Laser Institute ELI and Co-Executive Editor-in-Chief of the new NATURE journal *Light: Science & Applications*.



XINBING LIU has been the director of Panasonic Boston Laboratory (PBL) of Panasonic R&D Company of America since the beginning of 2006. He joined PBL in 1998 as project manager, and subsequently became program manager, group director and is now the deputy director. Prior to Panasonic, he was with Electro Scientific Industries as senior research and development engineer working on laser

packaging applications in 1998. Dr. Liu obtained his Ph.D. in applied physics from the University of Michigan and did his graduate work at the Center for Ultrafast Optical Science (CUOS). When he joined PBL he became responsible for the overall technical work of the lab and led several successful projects developing key technologies in laser processing and micro-optics. He won a number of awards at Panasonic for his technical contributions to the company. Liu has been actively involved in sponsoring LIA

conferences, serving as chair of the Laser Microprocessing Conference of ICALEO in 2007 and 2008, and was the general chair in 2009.



ERIC MOTTAY graduated in 1985 from the Ecole Supérieure d'Optique near Paris, the leading institution in France for Optical Engineering. Within the Commissariat à l'Énergie Atomique, he developed fiber delivery systems for Nd:YAG laser welding. In 1986, he joined B.M. Industries, a laser manufacturing company, initially as a research engineer, then as Technical Director.

He specialized in the development and manufacturing of solid-state lasers. In 1997, he moved to the U.S. to start the U.S. operations of B.M. Industries, where the activity was growing and profitable within one year. In 2001, he founded Amplitude Systemes in Bordeaux, France. Under a technology transfer from the University of Bordeaux, and starting from a scientific proof of concept, he developed the company into what is today a leading industrial ultrafast laser manufacturer. In doing so, he developed during the past 10 years many scientific and industrial partnerships with research institutions, technology centers and industrial companies.



ROBERT MUELLER has over 25 years of experience working with all laser types, 20 of which were dedicated to industrial laser applications and systems. Dr. Mueller received his Ph.D. from York University, with a thesis on laser welding dynamics, as well as a M.Sc. in Laser Physics from The University of Toronto. Currently, he is a Senior Laser Solutions Specialist at NuTech Engineering Inc. in Milton, ON, Canada.

NuTech Engineering designs and builds custom automated welding and cutting systems. In addition, Mueller is responsible for system design, laser system certification and laser safety training of NuTech and customer personnel. Prior to joining NuTech, Mueller worked with laser systems at Dofasco (now part of Arcelor-Mittal Steel), Powerlasers, and as a post-doctoral researcher at the University of Waterloo, and the University of Tennessee Space Institute. In his profession, Mueller has maintained his Certified Laser Safety Officer (CLSO) designation since 2003.



ANDREAS OSTENDORF studied electrical engineering at the University of Hannover, Germany. In 1995 he joined the Laser Zentrum Hannover (LZH) as a scientist dealing with micro-machining using UV and ultrafast lasers. In 2000 he finished his Ph.D. thesis on comparing the interaction models of those two laser principles. After holding different offices at LZH, in 2001 he became its CEO and a member of the Board

of Directors. In 2008 he became a full-time professor at Ruhr-University Bochum, where he holds the chair of Laser Applications

Technology (LAT). Dr. Ostendorf has been greatly involved in ICALEO and was a co-chair in 2002, 2003 and 2004 and was the General Chair in 2005 and 2006. He was elected to the Board of Directors of LIA for the term of 2004-2006 and has also been a member of the Executive Committee of LIA, responsible for the coordination of conferences, since 2005. Ostendorf was LIA president in 2008. He is currently a Fellow of LIA and SPIE and also a member of the WLT German Scientific Laser Society, which cooperates internationally with LIA.



SILKE PFLUEGER has over 25 years of experience in industrial lasers and their applications. Dr. Pflueger started her career in lasers at the Fraunhofer Institute for Laser Technology in Aachen, Germany, working on laser development and applications projects. This also brought her to the U.S., specifically to the Fraunhofer Resource Center in Michigan as a project manager, where she was involved in establishing the newly

founded group as a center of excellence for laser technologies in Michigan and beyond. Pflueger received her Ph.D. in mechanical engineering from the Technical University in Aachen. Since then, Pflueger has also held positions as Director of Sales and Marketing for Laserline Inc. and Director Sales North America for SPI Lasers. At SDL/JDSU she held engineering and marketing positions, working with high power laser diodes and fiber lasers. Today, she represents ULO Optics in the Americas.



ISLAM SALAMA works as a technology development manager and a group lead with Intel Corporation in Chandler, AZ. He has a Ph.D. in laser materials processing from the College of Optics and Photonics (CREOL) at the University of Central Florida. He works in the field of semiconductor manufacturing and microelectronic packaging focusing on the development of various lasers and patterning processes for high density

interconnect and microelectronic substrates. He has authored over 25 technical papers, was awarded two international patents and has more than 30 patent-pending inventions in the fields of laser technology, laser materials processing and semiconductor fabrications. Throughout his tenure with Intel Corporation, Dr. Salama has enabled various innovative laser technologies for inspection, lithography and micromachining process in high density interconnect integration. Salama has been involved in the field of laser materials processing and laser applications over the last 10 years and has been an active member of the LIA for the last 8 years. ■

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USE OF LASERS IN VETERINARY MEDICINE

By Kenneth E. Bartels

With the increased use of lasers in veterinary medicine during the past 20 years, the perception that the medical laser is a “tool in search of an application” is out of date. Initially, the cost of laser technology for veterinary medicine was a limitation, but this impediment did not prevent wide spread use in general veterinary practice, especially when the advantages overshadowed the disadvantages. Even considering the required learning curve for efficacious use of a new technology, as well as the attendant safety concerns, the use of surgical lasers in both large and small animal veterinary practice increased based, for the most part, on practitioner implementation rather than from objective peer-reviewed research studies originating at academic institutions. That does not mean results of objective controlled and retrospective studies did not appear in veterinary journals, but much of the enthusiasm was promoted through veterinary magazine-type articles often written by veterinarians supported by specific laser companies marketing to the veterinary profession. In addition, many of the laser medicine continuing education venues at international, national, regional and local professional meetings were, and still are, sponsored by respective laser manufacturers. Without that positive commercial impact, albeit somewhat subjective at times, use of lasers in veterinary medicine would have most likely been limited to veterinary schools and larger general practices. High power (Class 4) lasers have been the devices that opened the door to more extensive use of the technology in veterinary medicine.

Laser use in veterinary medicine has revolved primarily around the use of the high power carbon dioxide laser and often initially promoted/marketed for specific procedures including the feline onychectomy and precisely controlled tissue excision of pathologic soft tissue. Use of the articulated arm versus the semi-flexible hollow waveguide for directing the far infrared wavelength (10,600 nm) to the target tissues still creates a great deal of discussion regarding which type of delivery system is superior for veterinary use. Even so, development of smaller, robust CO₂ lasers at prices compatible with veterinary economics, as well as successful and knowledgeable marketing, have all played important roles in the growth of CO₂ laser use. Advantages that have included excellent hemostasis of smaller blood and lymphatic vessels, as well as a decrease in postoperative pain, presumably due to photothermal sealing of nerves, have contributed to the technology's popularity in general veterinary practice.

Fiber delivered wavelengths that include Nd:YAG (1064 nm), diode (805 / 980 nm) and Ho:YAG (2100 nm) lasers have been used for both non-contact and contact fiber-directed surgery. A tremendous advantage included the ability to perform minimally invasive surgery through both rigid and flexible endoscopes.

Endoscopic approaches have been extremely useful for upper respiratory and urogenital procedures in the horse (Nd:YAG and diode) and lithotripsy (Ho:YAG), as well as thoracolumbar intervertebral laser disc ablation (Ho:YAG), as a prophylactic procedure in the dog. With advances in diode laser technology, use and availability of the Nd:YAG laser in veterinary medicine have been minimized in most practice situations. Limitations of fiber delivered lasers in the near infrared wavelengths for both contact and non-contact procedures have included a potential for increased collateral photothermal effects due to the wavelength absorption characteristics and the increased tissue scatter of laser energy. Using the diode laser as a light scalpel in contact mode probably does require a higher level of practice in most practitioners' hands to minimize collateral photothermal effects.

Photodynamic therapy (PDT) has been used in veterinary medicine for certain types of tumors, although the availability and cost of appropriate photosensitizers up to this point has limited its practical application in veterinary oncology. The use of both monochromatic laser and broader band LED or filtered light sources is still being actively investigated.



Low level laser therapy (LLLT) or laser biostimulation has recently exploded in its application for certain conditions in veterinary medicine. Class 2, 3R, 3B and 4 lasers are all now being used as LLLT devices. As was initially observed with high power lasers in surgery, veterinary practitioners first adopted the technology for treatment of various conditions including pain management and enhanced healing of wounds (chronic and acute). LLLT has been used for many years outside the U.S. with many scientific articles published regarding beneficial effects at the cellular level, as well as positive effects related to treatment of clinical conditions related to pain management and wound healing. There is still much to learn about this technology, but it is now accepted as a beneficial treatment modality by more and more practicing veterinarians. Still, more controlled clinical

trials must be performed to augment the numerous anecdotal reports often published in the trade magazines.



Considering the history for the use of lasers in veterinary medicine, it is obvious the technology is here to stay and will benefit veterinary patients greatly. The most recent guideline (ANSI Z136.3 – 2011 *American National Standard for Safe Use of Lasers in Health Care*) now includes veterinary medicine in the nominative portion of the document. It is the inherent responsibility of the profession to provide safe and efficacious use of all classifications of lasers not only to protect the patient, but also the operator and any assistant who works within the

nominal hazard zone. Appropriate signage, wearing wavelength specific laser safety glasses, avoiding potential reflection from shiny surgical instruments, protecting non-target tissue, shielding endotracheal tubes with free-flowing oxygen from the laser beam and evacuating the generated laser plume with appropriate smoke evacuation systems are all concerns that must be addressed during the training phase, as well as during every laser surgical procedure. The use of surgical lasers in veterinary medicine may have created an entirely new definition for performing surgery but the devices still must be considered as “tools” to do the procedure more precisely and more effectively. A veterinarian’s knowledge of pathophysiology and surgical expertise must be the primary factors to determine whether a laser should be used for a particular surgical or treatment procedure in lieu of a more conventional approach. Our profession’s practical, economic and objective approach to any new technology, including laser surgery and low level laser therapy, is essential. ■

Dr. Kenneth E. Bartels holds the McCasland Professorship in Laser Surgery in the Center for Veterinary Health Sciences at Oklahoma State University.

ANSI Z136.3 2011 SAFE USE OF LASERS IN HEALTH CARE



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Laser Applications and Safety

LASER WORLD OF PHOTONICS 2013: INTERNATIONAL INDUSTRY GATHERINGS

LASER World of PHOTONICS in Munich is the world's leading trade fair for optical technologies and will celebrate its 40th anniversary from May 13-16, 2013. During the fair, some of the world's most important scientists for photonics meet at the World of Photonics Congress, which is part of the overall event and consists of six major conferences to be held at the trade fair center from May 12-16.

LASER World of PHOTONICS has been the world's foremost event for optical technologies since 1973. As the world's leading platform for lasers and photonics, together with the World of Photonics Congress, taking place at the same time, it covers the entire range of optical technologies. The World of Photonics Congress is the most important congress for photonics in all of Europe. It is an international networking platform and unites six conferences that are organized by leading international organizations. The fair takes place in Munich every other year at Messe München's fairground.

As a key technology for several application sectors, photonics is one of the most important, rapidly-growing industries of the future. It is of vital importance in sectors such as lighting and energy, production, mobility, information and communications, security technology, metrology and medicine.

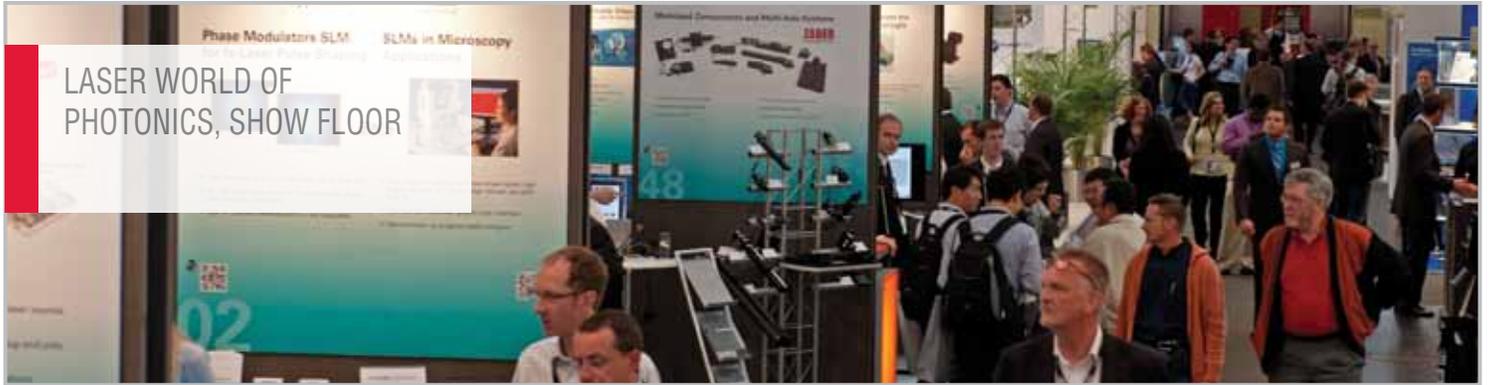
LASER World of PHOTONICS focuses on three main themes: "Biophotonics and Life Sciences," "Lasers in Manufacturing" and "Green Photonics." Solutions for meeting the challenges

that face modern society in the sectors for energy and health care and the ability to compete in production also play a special role. Examples of exhibits in these sectors include laser applications for e-mobility, power engineering and automobile manufacturing, printed and organic electronics, modern solid-state light sources (LEDs, OLEDs), additive manufacturing in production, lasers for analysis and imaging in biophotonics, as well as laser applications and optical diagnostics in medicine.

Integrated, intelligent photonics sensors are also giving rise to entirely new applications: high-integration, networked and intelligent sensors that largely evaluate and further process measuring signals are resulting in systems that are nearly autonomous. This is for example how 3D vision is made possible. A well-known example of this is the Microsoft Kinect™ technology, which makes it possible to control video games via the use of gestures. This approach could also be put to use in industrial applications, where augmented reality represents another possible use for 3D vision. For example, special glasses could be used to project additional information into the employees' field of vision to help them with manufacturing and control tasks.

The presence of leading international manufacturers, scientific excellence and user industries makes LASER World of Photonics the world's leading marketplace for laser and photonics technology. There were also plenty of reasons to celebrate the last time the fair was held in 2011: In that year, the show managed





to strengthen its leading international position even further, setting a new record with more than 1,100 exhibitors from 38 countries and 27,500 visitors from more than 80 countries. All in all, 58 percent of all exhibitors and 53 percent of all visitors came from countries other than Germany. Furthermore, a total of 3,450 experts from around the world participated in the Congress at the International Congress Center Munich (ICM) in 2011.

LASER WORLD OF PHOTONICS CHINA – A LEADING TRADE FAIR IN ASIA

LASER World of PHOTONICS China continues to grow, and the number of exhibitors at the 2012 fair increased to 475 companies from 19 countries. The number of visitors increased to 34,326. This rapid growth illustrates the market position LASER World of PHOTONICS CHINA enjoys in Asia. It is the leading trade fair for optical technologies in the People's Republic of China and is well on its way to becoming the most important industry platform for optical technologies in all of Asia. The next LASER World of PHOTONICS China takes place at the Shanghai New International Expo Center, Shanghai, P.R. China, from March 19-21, 2013.

LASER WORLD OF PHOTONICS ON EXPANSION COURSE – IN INDIA SINCE 2012

Together with its subsidiary Messe München International (MMI) India, Messe München has expanded its global network by adding a new event - LASER World of PHOTONICS INDIA in Mumbai, India - to its existing trade fairs LASER World of PHOTONICS in Munich and LASER World of PHOTONICS CHINA in Shanghai. The fair was held for the first time at the Bombay Exhibition Centre (BEC) from September 14–16, 2012. A total of 2,699 trade visitors and 127 exhibitors participated in the premiere. In the future, the fair will be held on an annual basis. The next fair will be held from November 12-14, 2013. ■

Additional information about the World of PHOTONICS:
www.world-of-photonics.net

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CORPORATE MEMBER PROFILE

LASERAGE TECHNOLOGY CORPORATION

LIA Corporate Member Laserage Technology Corporation is a global provider of precision laser contract manufacturing and laser processing services. As the largest custom laser job shop in the world, Laserage is uniquely qualified for manufacturing capabilities such as precision tube cutting, laser scribing, machining, drilling and welding. Active in leading industries including healthcare, aerospace and microelectronics, Laserage utilizes innovative laser technologies and over 30 years of expertise in order to engineer laser-based solutions in a growing world market.

Founded in 1979 by Art and Steve Capp, Laserage Technology Corporation is a closely held private company whose shareholders include management and family. Since its inception, Laserage has achieved recognition for its extensive lineup of custom laser processing services and adaptability to the needs of customers and markets. With a total of 130 employees, Laserage's laser processing facility is located in Waukegan, IL. Laserage Technology Corporation is also the majority investor in Venta Medical in Union City, CA, a medical contract manufacturer.

Laserage offers a wide selection of manufacturing and laser processing services made possible by custom systems, innovations and recognition of industry standards. The use of custom designed CO₂, Nd:YAG, fiber, disk and femto laser systems allow Laserage to apply precise laser processing to a variety of materials. For industrial, aerospace, microelectronics and medical component customers, Laserage uses the unique capabilities of lasers to provide cutting, drilling and welding of ultra hard super alloys, quartz, plastic, polymers and other materials that are essential to numerous markets. "We pride ourselves as having the right tool for the job," said Dan Capp, Vice President of Sales Development for Laserage.

One such tool is the up and coming technology of ultra-fast pulsed lasers, which will continue Laserage's efforts in laser manufacturing and processing. "Ultra-fast pulsed laser solutions are growing rapidly for both medical and commercial applications," said Capp.

Laserage's quality of service is ensured by its dedication to excellence and adherence to global standards. The corporation is registered to ISO 13485—the international standard for medical devices—which demonstrates a learned capability to manufacture and process implantable device components and other medical instruments and systems. Compliance with quality standards has also enabled Laserage to provide critical quality engineering services for original equipment manufacturers.

"For the quality engineering services our customers are pushing validation requirements down to the supplier instead of doing these evaluations in-house," said Capp.

In addition to custom laser processing and manufacturing, changes in industry standards have inspired Laserage to offer secondary operations to pursue new opportunities and markets.



"Medical device manufacturing has been our target for the last decade," said Capp. Growth in medical and commercial industries has greatly influenced Laserage's recent developments, whether through the acquisition of Venta Medical or the introduction of secondary services.

Post processing operations such as electropolishing, micro-blasting and shape-setting allow Laserage to continue providing cutting-edge service to a worldwide market while pushing the corporation forward technologically.

"The secondary operations require skills that do not normally fall in the laser processing tool kit. Additionally, we have had to become a global company requiring the knowledge and ability to export to most parts of the world," said Capp.

An LIA member since 1992, Laserage Technology Corporation understands the importance of industry-wide connections and specialized sources of information. "Being part of LIA has brought us networking opportunities with the close knit community of laser processing providers and laser manufacturers. LIA is a resource that we point [out to] people looking for equipment, services or information that we do not provide the marketplace," said Capp. ■

For more information, visit www.laserage.com.

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ASC Z136 UPDATE

UPCOMING MEETINGS

COUNTDOWN TO THE ANNUAL MEETING

As the luck of the Irish would have it, the ASC Z136 Annual Meeting will be held on **Sunday, March 17, 2013**, the day before the start of the International Laser Safety Conference (ILSC®) in Orlando, FL. The meeting is scheduled to begin at 9:00am EST; the meeting agenda will be available in early February.



Following the meeting, ASC Z136 members are invited to join in the pre-conference festivities at the ILSC Welcome Reception.

ASC Z136 meetings are open to the public; however, RSVP is required for meal planning purposes. If you have any questions regarding the annual meeting, would like a meeting agenda,

and/or plan to attend as an observer, please contact Barbara Sams at bsams@lia.org or call +1.407.380.1553 for more information.

HOTEL ACCOMMODATIONS

Committee members are asked to make their reservations prior to February 22nd to ensure room availability and to receive the conference room rate. A link to book online is available on the ILSC conference web page, www.lia.org/conferences/ilsc/hotel_information.

ANCILLARY MEETINGS

Space is available Monday through Friday for subcommittee or working group meetings on a first-come, first-serve basis.

If you are interested in scheduling or attending an ancillary meeting, please contact Barbara Sams at bsams@lia.org or call +1.407.380.1553.

MEETINGS SCHEDULED TO-DATE:

DAY/DATE	START TIME	FUNCTION	CONTACT
Sat, Mar 16	9:00am	SSC-3 Kick-off	Ray Lanzafame or Penny Smalley
	3:00pm	ADCOM (members-only)	Barbara Sams
Mon, Mar 18	2:00pm	SSC-7	Jim Sheehy
Tues, Mar 19	8:00am	SSC-10	Jay Parkinson
	8:30am	SSC-4 Kick-off	Jeff Pfoutz
	1:00pm	SSC-8	Ken Barat
	1:30pm	TSC-1	Bruce Stuck
Wed, Mar 20	8:00am	SSC-10	Jay Parkinson
	8:30am	TSC-4	Bill Ertle
Fri, Mar 22	8:00am	IEC TC76 WG1/WG8	David Sliney

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BLS UPDATE

As the year comes to a close, some CLSOs and CMLSOs are struggling to come up with the 10 certification maintenance (CM) points required for recertification. Often opportunities to earn CM points are overlooked. The fact is, once an event is over there is no way to go back in time to attend.

One such opportunity is the International Laser Safety Conference (ILSC®), which will be held in Orlando, FL the week of March 18-21, 2013.

ILSC is so much more than just listening to world-renowned laser safety experts, who will be presenting papers relevant to how today's technology affects laser safety considerations. In addition to updates on safety standards, laser safety training, product safety, bioeffects, etcetera, a special session on visual effects (glare and dazzle) is offered, along with the return of the scientific medical safety session.

The Practical Applications Seminar (PAS) portion of the conference was developed with the working Laser Safety Officer (LSO) in mind. Again this year, PAS will feature two days of medical practical applications, followed by two days of technical (non-medical) practical applications. A dynamic team of experts with various medical laser experience and knowledge has put together an exciting Medical PAS, which will benefit participants regardless of experience level or specialty. The Technical PAS consists of topics such as laser lab design lessons learned, reporting requirements for lasers, how to perform laser hazard calculations, optics for LSOs and a historical review of laser safety accidents.

Networking opportunities abound at ILSC. This is the place to make new contacts and catch up with old friends and colleagues. ILSC social events provide time to connect with other attendees, as well as event sponsors, in a relaxed atmosphere.

Monday evening (March 18), the BLS will host its Appreciation Reception for all CLSOs and CMLSOs in attendance. This event is by invitation only; however, invitations are available for those interested in becoming certified.

Please contact Blake Sutton at bsutton@lasersafety.org for your invitation!

Please join us at ILSC in March. In addition to the aforementioned continuing education and experience gained by participating, you can earn up to 4 CM points for attending.

Register today at www.lia.org/store/conf/ilsc2013.

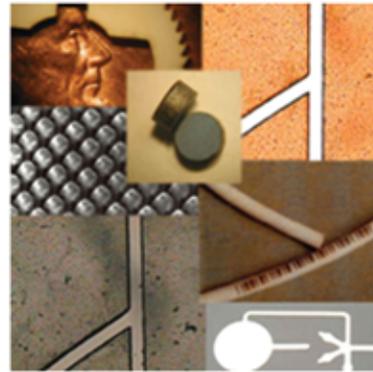
REMINDER:

A note to those whose CM cycle ended December 31, 2012, it is not too late to restore your active status. CM worksheets, accompanied with the appropriate recertification and late fees, will be accepted until May 31, 2013.

If you have any questions about the BLS, or the recertification process, please contact Blake Sutton at bsutton@lasersafety.org or Barbara Sams at bsams@lasersafety.org, or call +1.407.380.1553.



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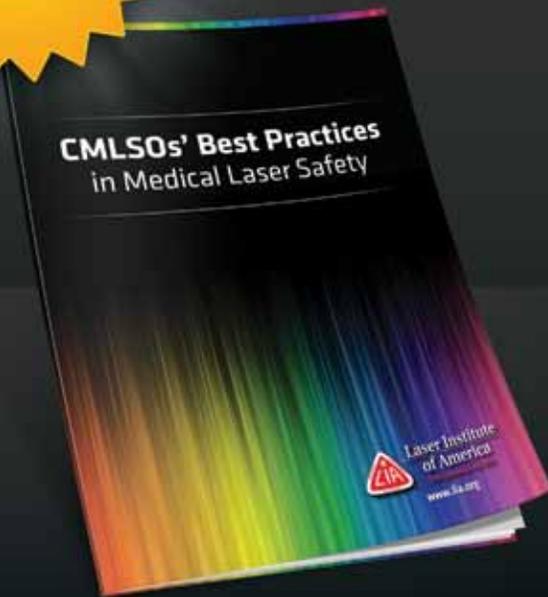
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CMLSOs' Best Practices in Medical Laser Safety



CMLSOs' Best Practices in Medical Laser Safety

A Must Have For All Medical Laser Personnel!

The Laser Institute of America has assembled the expert knowledge of leading certified medical laser safety officers in a new 11-chapter book. The book compiles the latest knowledge about establishing a medical laser safety program, including laser safety regulations, how to control and evaluate such programs, and the duties of LSOs. It also covers:

- Beam and non-beam hazards
- Factors that determine laser-tissue interaction
- Importance of safety audits
- Includes inspection checklist, laser inventory sheet, laser procedure record and laser safety audit forms
- Includes Medical Laser Safety Education Training Module on CD ROM

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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. View complete articles of the abstracts below online under the Featured Category.

FEATURED ABSTRACTS

HUNDREDS OF MILLIWATTS SUPERCONTINUUM GENERATION IN ALL-FIBER LASER

By Chang Sun

All-fiber supercontinuum (SC) laser source has important applications in various fields such as laser radar, fiber communications, biomedical imaging and spectroscopy. In particular, hundreds of milliwatts SC source can be applied in biomedical imaging like fluorescence lifetime imaging, spectroscopy and optical coherence technology because it can improve the resolution of the image compared with other optical sources. In these areas, requirements of hundreds of milliwatts SC source are focused on bandwidth and flatness of spectrum, while the power in general application remains only hundreds of milliwatts. Currently, however, a supercontinuum that meets such requirements is reported rarely, because the nonlinear effects in PCF (photonic crystal fiber) causing supercontinuum generation is not easily produced at low power.

LASER SURFACE TEXTURING OF BIOMATERIALS

By Antonio Riveiro, Ramón Soto, Rafael Comesaña, Mohamed Boutinguiza, Jesús del Val, Félix Quintero, Fernando Lusquiños, Juan Pou

One of the main requirements of a bone implant is to be able to withstand severe mechanical conditions during the required lifetime of the component. Nevertheless, the success of a bone implant relies upon the quality of the bone-implant reaction, which is markedly influenced by the surface topography and chemistry of the implant material. Biomaterials commonly used in implants only satisfy part of these requirements; for example, biomaterials such as Titanium or PEEK (poly aryl-ether-ether-ketone), have a high strength, good wear resistance, and excellent chemical resistance but their inferior bioactivity may lead to poor bone-implant interactions. Therefore, an intervening fibrous tissue layer occurs around the contact area between the bone and the implant.

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- Learn how to characterize R&D laser devices, set up labs and establish control measures to mitigate hazards.
- Discover the unique duties of the R&D LSO, as well as traditional laser basics for the health and safety professional embarking on the role of LSO.
- Understand the elements of a sound safety program and how to respond to potential accidents.



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JLA UPDATE

The Laser Institute of America's official refereed publication, the *Journal of Laser Applications*[®] (*JLA*), an online-only journal, is 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* features nine topic sections, a faster peer-review process and a more functional website (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.

RESEARCH HIGHLIGHT

A COMPARATIVE STUDY OF CUT FRONT PROFILES AND ABSORPTIVITY BEHAVIOR FOR DISK AND CO₂ LASER BEAM INERT GAS FUSION CUTTING.

By Leonardo Daniele Scintilla, Luigi Tricarico, Achim Mahrle, Andreas Wetzig, Eckhard Beyer

Results of experimental investigations on disk and CO₂ laser beam fusion cutting cold-work tool steel 90MnCrV8 are presented. The study was performed with the aim to detect features of the cut front geometry and differences in the corresponding absorptivity behavior as a function of the laser wavelength. Longitudinal sections of the cut front were prepared for different sheet thicknesses, focal plane positions, and cutting speeds. The digitalization of the geometrical cut front data enabled the determination of local inclination angles and the calculation of corresponding Fresnel absorptivity values. The analysis revealed that particular areas of the cut front geometry are preferably inclined to values close to the Brewster angle which offer the theoretical maximum absorptivity for both laser types.

SUBSCRIPTION INFORMATION

BY PHONE

For non-members of LIA, call the American Institute of Physics at 1.800.344.6902 for subscription information.

ONLINE

Sign up at jla.aip.org/alerting_services/table_of_contents_alerts to receive your *JLA* table of contents email alerts.



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MEMBER INNOVATIONS

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Cambridge Technology's FlexScan-3D Systems are application-flexible integrated 3-Axis solutions for scanning applications demanding excellent large field and 3D processing speed and accuracy in a compact and cost-effective enclosure with industry standard interfaces. The flexibility of the FlexScan-3D System comes from its configurability, programmability, diffraction-limited spot size and high power laser handling capability of the Cambridge Technology Post-Objective Scanning (3-Axis) Technology. Leveraging Cambridge Technology's best-in-class, patented analog and digital Galvo technology and state-of-the-art mirror design, CTI FlexScan-3D 3-Axis Laser Processing Heads are the ultimate scanning solution for complex Industrial Laser Processing Applications. For more information, visit www.camtech.com.

JOINING TECHNOLOGIES NOW OFFERS ID CLADDING

Joining Technologies, Inc., an innovator in industrial laser applications, announces that it has expanded its additive manufacturing capabilities to include internal diameter (ID) cladding. Together with its partners Fraunhofer ILT, Pallas Oberflächentechnik GmbH & Co KG and Laserline, Inc., Joining Technologies has installed a specialized ID cladding station. While laser cladding has gained wide acceptance as a cost effective way to add wear or corrosion-resistant coatings, or to repair worn-out or mis-machined parts, most of the cladding to date has been limited to easy-to-reach external part features. The new ID cladding station is a technological leap forward. For more information, visit www.joiningtech.com.

MEMBERS IN MOTION

COHERENT, INC. ACQUIRES LUMERA LASER

Coherent, Inc. (Santa Clara, CA) announced that it had acquired Lumera Laser GmbH (Kaiserslautern, Germany) a recognized industry leader in ultrafast lasers for Micro-Electronics, and Precision Materials Processing. The acquisition complements Coherent's existing portfolio of industrial ultrafast lasers and broadens the company's product capabilities in these rapidly developing markets. It is anticipated that Lumera will play a central role in the expansion of Coherent's ultrafast product and market growth through its new product capabilities and applications expertise. For more information, visit www.coherent.com.

CREOL AFFILIATES DAY & NEW SHORT COURSES

Please join us for CREOL's Industrial Affiliates Day 2013 on Friday, March 8th. An exciting program has been planned with a theme of *Lasers in Action*. Topics include: lasers in manufacturing, optogenetics, lithography, and display. Four distinguished speakers are invited: John Fourkas (University of Maryland), Jyoti Mazumder (University of Michigan), Nasser Peyghambarian (University of Arizona), Alipasha Vaziri (University of Vienna). Four CREOL faculty will also give talks reporting research at UCF. The program will also include a Photonics Business session with an invited talk by Milton Chang (Incubic Management LLC) and a panel discussion on "Future Challenges for Photonics in Manufacturing." A new feature this year is Short Courses. Four 90-minute short courses are scheduled in the afternoon of Thursday, March 7th, offered by CREOL instructors. For more information on the program and short courses, visit www.creol.ucf.edu/Partnerships/Affiliates/AffiliatesDay2013.

LASYS 2014 POSTPONED THREE WEEKS

Contrary to initial announcements, LASYS 2014, the international trade fair for laser material processing, will now take place three weeks later than originally planned from 24 to 26 June. The reason for the change is the postponement of the UKIP automotive trade fairs Engineexpo, Vehicle dynamics Expo, Global Automotive Components and Suppliers, Automotive Testing Expo and Automotive Interiors Expo by the British organiser UKIP Media & Events Ltd. "With the postponement we are also able to guarantee for 2014 the unique synergy effects of LASYS 2012, which were rated very positively both by exhibitors and visitors," states Meike Mayer, Project Manager for LASYS, about the co-location of the events again. For more information, visit www.messe-stuttgart.com.



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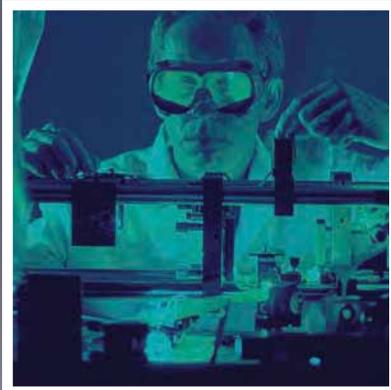
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LIA ANNOUNCES



LASER U

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LIA'S NEWEST EDUCATIONAL REASOURCE: LASER U

Raising the bar yet again with its online course offerings, the Laser Institute of America is set to unveil Laser U — a new and easy way for laser professionals of all levels of experience to access the best presentations from LIA's industry-leading conferences and workshops. Slated to launch in February, the modules of Laser U will provide the ultimate in flexible access to the information you want. Users will be able to follow the text and audio of each speaker's presentation at their own pace — over the course of several hours, even several days — with the option to follow each slide in order or jump forward or backward as they wish. Any demonstrational videos used by the presenters will appear in the course, as well. Online "attendees" can feel more confident interacting with major players in the laser industry and discussing how different lasers and systems can benefit their manufacturing operations. For further information or to sign up for modules as they become available, visit www.lia.org/education or call 1.800.34.LASER.

LIA'S R&D COURSE IS A SUCCESS!

On December 12-14, 2012, the LIA hosted its inaugural "Laser Safety Officer in the R&D Environment" course. This course was taught by Ken Barat, chairman of the subcommittee that put together the newest standard published by LIA, the ANSI Z136.8 *Safe Use of Lasers in Research, Development, or Testing*. The main goal of this new course is to prepare Laser Safety Officers (LSOs) to oversee the safe use of lasers in oftentimes ad hoc situations. This new course provides a roadmap for navigating uncharted territory for someone who is appointed an LSO in the R&D laboratory environment. Due to its high demand, the LIA will be hosting another course March 13-15, 2013. For more information, or to register, visit www.lia.org/education or call 1.800.34.LASER.

LME[®] 2013

LASERS FOR MANUFACTURING EVENT[®]

LME 2013 – SAVE THE DATE!

LIA's third annual Lasers for Manufacturing Event (LME[®]) is going to be held September 11-12, 2013 in Schaumburg, IL – in the backyard of the United States' manufacturing industry. LME 2013 will provide a one stop event for companies interested in integrating laser technology into their production. Visit the show floor theater for keynote presentations on the overall impact of lasers in general manufacturing, plastics manufacturing and the

laser requirements for aerospace and automotive manufacturing. Attend the expanded free educational sessions covering not only the main laser types, laser systems, ROI and safety but courses on the fundamentals of laser cutting, laser robotics and laser additive manufacturing. Learn from world famous authorities, understand how laser technology is the future of manufacturing and how it is applied, and connect with the suppliers who can help you to benefit from using lasers in your manufacturing. For more information on attending, exhibiting at or sponsoring LME 2013, visit www.laserevent.org or call 1.800.34.LASER.

ICALEO[®]

32nd INTERNATIONAL CONGRESS ON
APPLICATIONS OF LASERS & ELECTRO-OPTICS

ICALEO 2013 – MARK YOUR CALENDAR!

Come and be part of LIA's 32nd International Congress on Applications of Lasers & Electro-Optics (ICALEO[®]) October 6-10, 2013 in Miami, FL, where researchers and end-users meet to review the state-of-the art in laser materials processing and predict where the future will lead. ICALEO has always been devoted to the field of laser materials processing and is viewed as the premier source of technical information in the field. Topics will include laser process monitoring and control, laser processing of biological materials, laser hybrid processing, laser manufacturing for alternative energy sources and laser business development. For more information on attending ICALEO, or for sponsorship and vendor opportunities, visit www.icaleo.org or call 1.800.34.LASER.

LIA OFFERS CO₂ MEDICAL LASER SAFETY COURSE ONLINE

The LIA makes using the CO₂ laser easier than ever with its online "CO₂ Medical Laser Safety Training" course. Not only does the easy-to-follow internet-based course allow learning anytime, anywhere, it earns registered nurses two contact hours upon completion. This course is geared to train all types of medical personnel, including preoperative staff like circulating nurses or surgical scrub techs, and covers the biophysics for the CO₂ laser, what standards apply, and what operational skills are required for different delivery systems. With this course and the recently updated medical laser safety standard ANSI Z136.3 *Safe Use of Lasers in Health Care*, LIA is ensuring that safety education keeps pace with the rapid adoption of lasers outside highly regulated medical environments — including instruction in home use and use of rented lasers. To register, or for more information, visit www.lia.org/education or call 1.800.34.LASER.

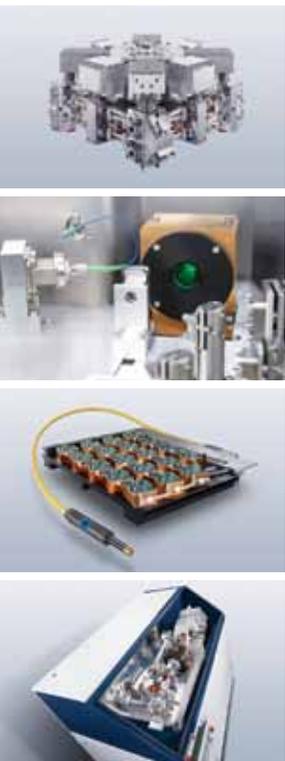


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