THE OFFICIAL NEWSLETTER OF THE LASER INSTITUTE OF AMERICA

LIA TODAY

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Image courtesy of: Lasermet Ltd

Focus:
LASER SAFETY

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

Laser Institute of America
Laser Applications and Safety

REVISED!

ANSI Z136.6 2015 SAFE USE OF LASERS OUTDOORS

REVISED DOCUMENT ADDRESSES:

- Improved readability and searchability
- Complete rewrite of the Control Measures section
- Metric unit standardization across the standard
- Updated Visual Interference Zones section
- Added definition of "Control Measures"
- FAA coordination requirements clarified
- Added comparison table for laser hazard classification
- General section and formatting updates to better reflect today's jargon

A Necessary Tool for Using Lasers Outdoors Safely!

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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 email to lia@lia.org.

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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

Dec. 6-8, 2016	Orlando, FL

Laser Safety Officer with Hazard Analysis*

Sept. 19-23, 2016	Las Vegas, NV
Oct. 17-21, 2016	San Diego, CA
Nov. 7-11, 2016	New Orleans, LA
Jan. 30 - Feb. 3, 2017	Orlando, FL

*Certified Laser Safety Officer exam offered after the course.

Industrial Laser Safety Officer Training

Aug. 17-18, 2016	Novi, MI
Nov. 16-17, 2016	Novi, MI

Medical Laser Safety Officer Training*

Aug. 27-28, 2016	New York, NY
Sept. 17-18, 2016	Las Vegas, NV
Oct. 15-16, 2016	San Diego, CA
Nov. 5-6, 2016	New Orleans, LA
Jan. 28-29, 2017	Orlando, FL

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

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

Oct. 16-20, 2016	San Diego, CA

Laser Additive Manufacturing (LAM®) Workshop

Feb. 21-22, 2017	Houston, TX

International Laser Safety Conference (ILSC®)

Mar. 20-23, 2017	Atlanta, GA

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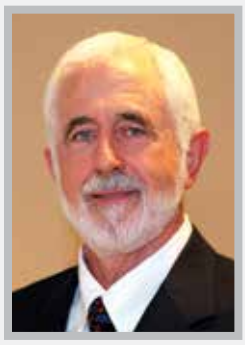
President's Message

This issue of the *LIA TODAY* is focused on laser safety, that of which is relevant to every laser user and his/her organization. I would like to take this opportunity to thank those who have been working hard in developing laser safety standards and the advancement of understanding laser beam characteristics and interactions with human tissues, which have enabled the safe use of lasers by most of us. I would particularly like to thank the immediate LIA Past President, Robert Thomas, who has been working tirelessly to promote laser safety by chairing laser safety standard committee meetings and conferences.

LIA is planning to develop laser safety education programs in Asia and Europe in the coming years. Professor Yongfeng Lu (LIA past president) will interact with the Japanese Laser Materials Processing Society to coordinate the development of a Laser Safety Asia education program. Professor Stefan Kaierle and Mr. Clive Grafton-Reed (Rolls-Royce) are leading the Laser Safety Europe education program development. I encourage you to interact with them in Asia and Europe to support the development of these two education programs, which will benefit the Asian and European laser communities where a rapid growth in the use of high power lasers is expected.

Lin Li, President
Laser Institute of America

Executive Director's Message



Change

It seems that change is the only thing we can be sure of, so adapting to change is required for health and growth. It makes sense then, as LIA approaches its 50th anniversary in 2018, to take a good look at our changing world of lasers, applications and safety.

New laser sources, wavelengths, pulse widths and power levels are opening up whole new fields of application. Then, as we learned at our recent Lasers for Manufacturing Event® (LME®) from LIA Past President David Belforte, there are geographic shifts in the location of new developments and the location of the end users.

2016 President Lin Li is leading us through the process of understanding the changing picture, determining how LIA should adapt in order to continue providing valuable goods and services to our industry and, finally, how to properly fund the desired changes.

Peter Baker, Executive Director
Laser Institute of America

ANSI Z136

Your Guide to Selecting the Right Laser Safety Standard

ASC Z136
Safe Use of Lasers
Accredited Standards Committee

As more and more workplaces in the United States begin to implement laser technology, the need to stay on the leading edge of laser safety updates becomes more important. Laser Safety Officers (LSOs) know that the best way to stay informed about laser safety standards and practices is to become familiar with the American National Standards Institute's (ANSI) Z136 series of laser safety standards.

Job shops, researchers and medical professionals want to prevent accidents. By following the ANSI standards, you are promoting a safe work environment while avoiding costly accidents and improving your overall safety footprint.

Having the laser safety standard most applicable to your profession is essential to maintaining a successful laser safety program. They are the only laser safety guidelines that are nationally accepted by a variety of organizations, including the Occupational Safety and Health Administration (OSHA) and The Joint Commission (TJC). And since the Laser Institute of America (LIA) serves as the publisher of the series, you can be confident that you are purchasing the most current laser safety information available.

The Z136 standards are revised after an extensive review process is completed to ensure that all information is correct and up-to-date. This process is led by one main committee, and further composed of an oversight committee, an editorial working group, five technical committees and 10 "standards" committees that are each responsible for a specific standard. Once a subcommittee has completed a standard, the other committees review the document — a process that can take several years.

Before publishing, the American National Standards Institute approves the document. However, ANSI does not approve the content. It approves the process by which the document was revised to "verify that the principles of openness and due process have been followed and that a consensus of all interested stakeholder groups has been reached." Once ANSI has approved the document, the secretariat makes any necessary formatting and grammatical edits before being sent to print.

The most recent update to the laser safety standards is the ANSI Z136.6 *Safe Use of Lasers Outdoors*. The 2015 revision expands upon the previous version and hopes to meet the evolving needs of outdoor laser operators. Designed for use by laser-light show operators, scientific and astronomical research, the Department of Energy, and the Department of Defense, the revised ANSI Z136.6 provides guidance for the safe use of lasers and laser systems (180 nm to 1 mm) that could possibly be hazardous in outdoor environments where open-beam paths are necessary.

There are a number of additional Z136 laser safety standards available that cater to a variety of industries and professionals, not just those using laser technology outdoors, including:

- ANSI Z136.1 *Safe Use of Lasers*
- ANSI Z136.2 *Safe Use of Optical Fiber Communication Systems Utilizing Laser Diode and LED Sources*
- ANSI Z136.3 *Safe Use of Lasers in Health Care*
- ANSI Z136.4 *Recommended Practice for Laser Safety Measurements for Hazard Evaluation*
- ANSI Z136.5 *Safe Use of Lasers in Educational Institutions*
- ANSI Z136.7 *Testing and Labeling of Laser Protective Equipment*
- ANSI Z136.8 *Safe Use of Lasers in Research, Development, or Testing*
- ANSI Z136.9 *Safe Use of Lasers in Manufacturing Environments*

As the parent document of the ANSI Z136 standards, Z136.1 is the number one seller and the standard that most laser safety officers purchase, according to Barbara Sams, the Executive Director of the Board of Laser Safety. This tool is essential for any LSO to have on hand.

In addition to this tool, having the laser safety standard that's most applicable to your industry is another great way to keep your laser safety program current, as it can serve as both a reference tool and a guide for your laser safety initiatives. Because laser safety measures are different for each industry, control measures for one industry can be very different from another. In health care, you would use Z136.3; in manufacturing, you would use Z136.9; and so on. Control measures for one area of practice do not necessarily apply to the other.

If you are just now beginning your journey as a Laser Safety Officer, the Z136 standards are a great tool to have while you complete the necessary training and develop your laser safety program. These standards provide protocols and procedures you can use to create a laser safety program in a facility that may not have had one before. By following the guidelines outlined in the standards, you are protecting your employees and satisfying OSHA requirements that state all employers must provide a safe workplace that meets a national consensus standard, in this case for laser safety.

The photonics industry is ever-changing, and LIA is dedicated to helping LIA members and non-members alike get the resources they need to ensure their laser safety programs are safe and up-to-date. If you have purchased one of the Z136 standards in the past, LIA will send you an email notification when the standard is revised — allowing you to stay on the forefront of new laser safety information.

"... Z136 STANDARDS ARE A GREAT TOOL TO HAVE WHILE YOU COMPLETE THE NECESSARY TRAINING AND DEVELOP YOUR LASER SAFETY PROGRAM."

You may purchase any of the Z136 laser safety standards in print or digital format on LIA's website. If you have any questions about the ANSI standards or LIA laser safety training options, you may contact us online. ■

Achieving Success
With a BLS Certification

BY BETSY MARONE

The Board of Laser Safety (BLS®) – a nonprofit organization affiliated with Laser Institute of America (LIA) – was tasked with the development and sustainment of a program that establishes a nationally-recognized level of competence and expertise in the field of laser safety. The BLS first created the Certified Laser Safety Officer (CLSO) program. Upon completion of this program, Laser Safety Officers (LSOs) prove their comprehensive knowledge of laser safety, which designates them as experts in their field. The BLS later developed the Certified Medical Laser Safety Officer (CMLSO) program, through which individuals are recognized as knowledgeable experts in the evaluation and control of laser hazards under the unique conditions found in the medical arena.

In an ever-changing job market, a BLS certification offers immense benefits. Faster and more cost-effective than returning to school for an additional degree, this certification enables individuals to receive a recognizable and respected credential. Certification also improves one's competitive edge in the industry. Adding a higher level of credibility to experience earned on the job, certification helps individuals stand out from other job candidates. The combination of laser safety experience and certification shows current and potential employers that these candidates are accomplished and qualified in this challenging field.

Greta Toncheva had first-hand experience with this, as she worked to become a CLSO after earning her degrees in Bulgaria and working at Duke University for 10 years. Following her work experience in assembling detectors for the Transition Radiation Tracker in the beam line of the Large Hadron Collider at CERN, Switzerland and then as a member of Duke Radiation Safety Group, Greta was hired to be the Lawrence Berkeley National Laboratory (LBNL) LSO.

Greta's rewarding work at LBNL includes helping staff researchers, visiting researchers and young graduate and post-doctoral fellows, and educating them on the laboratory's high safety standards. Greta enjoys playing a role in the success these researchers achieve in the end. While the combination of her laser safety experience and certification continuously sets Greta apart in the field, she finds that the certification adds to her credibility among fellow professionals, who respect her as an expert.

In addition to a competitive edge, a leading advantage of a BLS certification is the increase in job security it affords. No matter the state of the economy, laser safety is an integral component to companies' successes. Although budget cuts may call for the termination of certain positions, managers may be more likely to retain the certified professionals whose specialized skills, such as laser safety, are an asset to their company.

CLSOs and CMLSOs also provide companies with examples of their adherence to the regulations enacted by the Occupational Safety and Health Act (OSHA). Since OSHA requires employers to provide safe working environments, having CLSOs and CMLSOs on staff demonstrates the company's dedication to the high safety standards expected in laser safety programs.

This job security can also give way to enhanced opportunities for advancement and increased earnings. With the extensive knowledge and the respect the certification affords, CLSOs are prepared to pursue any future employment opportunities that may arise. Jodi Ploquin, an experienced CLSO, exemplifies this, as she has seized presented opportunities throughout her career. Currently a consultant with Krivonosov Risk Management Consultants Inc. (KRMC), Jodi is a Medical Health Physicist and Certified Laser Safety Officer with expertise in laser safety, laser radiation safety, nuclear security and system reviews following adverse events.

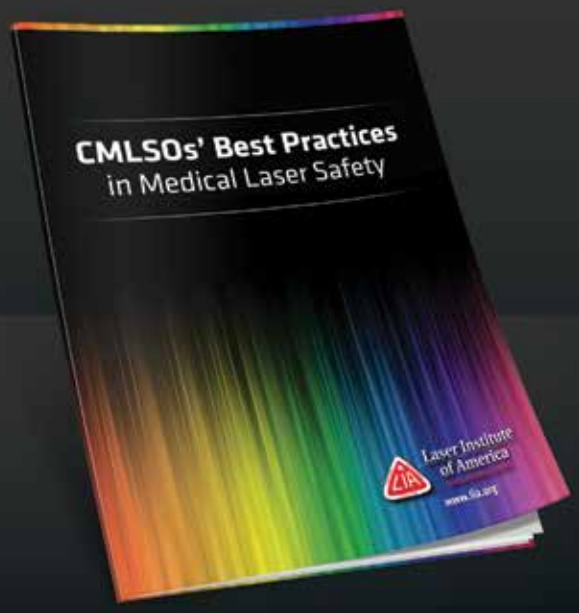
While working at the Tom Baker Cancer Centre as the Radiation Safety Officer, the Provincial Radiation Safety Officer asked if she would be interested in being the Provincial Laser Safety Officer for the Alberta Cancer Board. At this time, although Class 3B and 4 lasers were being utilized, there was no in-house Laser Safety Officer. To fill this void, Jodi took her LSO training and examination to earn her certification. Five years later, Jodi became a Medical Health Physicist at the Ottawa Hospital but quickly learned that the hospital lacked a formalized laser safety program. After conducting a gap analysis, developing a strategic plan for the program's implementation and presenting it to senior leadership, Jodi's department was awarded the necessary authority and resources to make the program a reality. Jodi worked as Laser Safety Officer in this new program for five years before she was asked to use her expertise to establish the Calgary Office of KRMC in order to extend laser and radiation safety services to Western Canada. The important work Jodi has completed as a consultant has led to the continuous growth and success of her career.

Medical Laser Safety Officers also benefit from certification in their field. As the medical industry continues growing at a fast pace, a BLS certification allows MLSOs to remain up-to-date with their laser safety knowledge and to uphold the highest standard of laser safety.

CMLSO Richard Gama recognizes the positive impact his BLS certification has had on his career. Beginning his work with lasers as a Surgical Technologist more than 30 years ago, he later became a health care laser system operator and has continued his work with numerous laser systems for varying medical and surgical procedures. After years of operating room experience and laser expertise, Richard was asked to become LSO for Universal Hospital Services, Inc. (UHS) formerly PRI Medical Technologies, Inc. With his certification, Richard established the company's laser safety program and policies. As a result of his certification, Richard has repeatedly faced and conquered the challenges that arise from the constantly-advancing laser technology, the continuous training and educating of health care personnel to meet today's standards, and the constant dispelling of antiquated myths about safety and laser program compliance. The knowledge he has gained throughout his career, as well as through his BLS certification, has allowed him to improve staff knowledge and change the laser safety culture at UHS and many health care facilities throughout the country.

The lack of understanding about lasers and their potential hazards increases the importance of CMLSOs, as they bring a level of assurance to patients who are seeking an optimal level of care. Because of the hazardous nature of lasers, they must be handled by individuals with an extensive knowledge of laser safety in order to prevent injuries. CMLSO Raphael Darvish learned of the dangers associated with lasers when he sustained a non-permanent eye injury at his medical practice in California. After this experience, he made laser safety an integral part of his practice. Earning his certification has not only allowed Raphael to better serve his staff and patients, but has also established him as a dedicated provider and a trusted expert in laser safety. Raphael now educates colleagues and clients on the dangers involved in the use of lasers and continues promoting laser safety in an industry where business owners would often rather spend time and money on promoting their business rather than on the pursuit of laser safety certification.

Overall, CLSOs and CMLSOs report that BLS certification has greatly improved their success. BLS Executive Director, Barbara Sams, agrees. "BLS certification is an elevation of status for the Laser Safety Officer; it shows that the individual has the specific knowledge, skills and abilities to perform the job of LSO," says Sams. "It demonstrates the individual's commitment to the job and validates the employer's dedication to a safe working environment." ■



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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Critical Laser Safety Tools

LIA's EVALUATOR & Mastering Light Receive Updates

BY JESSICA DAWKINS

The number of laser end-users is flourishing, and businesses are continuously compelled to seek ways to implement efficient and cost-effective employee laser safety programs. In an effort to offer all Laser Safety Officers (LSOs) and their staff with the most dynamic, leading edge laser safety training tools available, Laser Institute of America (LIA) recently updated two of its most recognized educational laser safety offerings: The EVALUATOR and the *Mastering Light: An Introduction to Laser Safety & Hazards* DVD.

The EVALUATOR software, first released in 2010 as the world's first ever web-based Laser Safety Hazard Analysis System, is now available in an alternative, desktop version to allow for 24/7 offline access and unparalleled convenience. In addition, a revised 2016 version of the *Mastering Light: An Introduction to Laser Safety & Hazards* DVD contains integral new rules and regulations that will help laser users stay safe and abreast of regulations and requirements in the ever-changing, fast-paced arena of laser technology.

Desktop EVALUATOR Provides Critical Offline Access; Layout Similar to Advanced Web Version

Over the last six years, the web-based EVALUATOR has proven itself as an integral hazard analysis tool for both its ease of use and accurate results. In January 2016, to best meet current laser safety needs, LIA unveiled an alternative, desktop platform of the EVALUATOR, delivered on a USB drive. Users can download the program to their computer, thus eliminating the need for Internet access.

Similar to the web-based version, the Desktop EVALUATOR performs a number of repeated calculations based on the ANSI Z136.1-2014 *American National Standard for Safe Use of Lasers*, including: maximum permissible exposure (MPE), optical density (OD), nominal ocular hazard distance (NOHD), nominal hazard zone (NHZ) and laser hazard classification. It also offers effortless switching of laser settings between CW, single pulse or repetitively pulsed lasers, in addition to the adjusting of the beam profile (circular, elliptical or rectangular).

A simple layout allows users to input variables, including wavelength, energy/power, pulse width, PRF, focal length, limiting aperture and more, on the screen's left-side panel, while final output appears on the right-side panel. Intermediate calculations are also shown to further verify hand calculations. Values for MPE, NOHD, NHZ, OD, specular NHZ and diffuse NHZ are provided for both eye and skin.

Both versions of the EVALUATOR offer a clean, seamless user experience, assisting LSOs of all skill levels with the necessary task of completing safety calculations in the field.

Now, companies and their various users can choose the format that best meets their specific needs. The Desktop EVALUATOR is compatible with Windows 7, 8 or 10 PDF viewer, and resembles the advanced subscription level of the web-based version.

This new version will undoubtedly benefit military users; whose firewalls often restrict continuous access to online content. Now, calculations can be performed without the fear of losing a connection.

Users can print reports or save the information to a file for later review. A User Guide, located in the Help menu, provides an overview of the program, from an explanation of how to perform an evaluation to parameter descriptions and calculated results.

Revised 2016 Mastering Light DVD Keeps LSOs Current on Safety Requirements

Laser Safety Officers must be relentless in finding ways to train on safety, especially with the regular installation of new and updated safety requirements. For years, the *Mastering Light: An Introduction to Laser Safety & Hazards* DVD has provided LSOs with a training tool that is not only easy to administer, but also effective in properly training employees, researchers and students alike.

Just like LIA's 2009 version, the 2016 version of *Mastering Light: An Introduction to Laser Safety & Hazards* video fulfills both the ANSI Z136.1 *Safe Use of Lasers* and the Occupational Safety

and Health Administration's (OSHA) laser safety requirements for employees who routinely work with, or could be exposed to, Class B or Class 4 laser radiation.

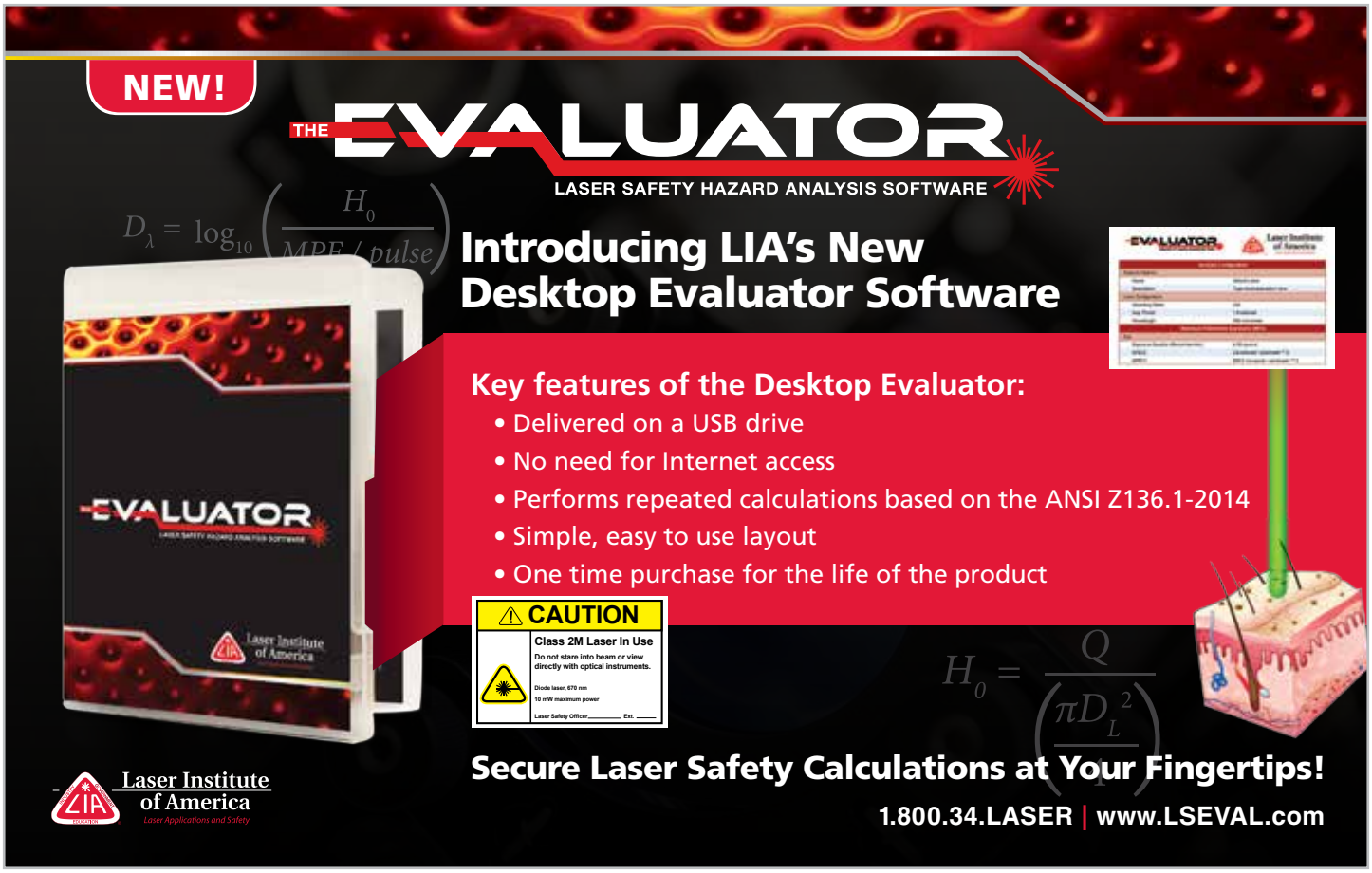
Video features include laser physics, classification of lasers by hazard potential, definition and duties of a Laser Safety Officer, beam and non-beam laser hazards, a clear explanation of labels and signs governing regulations, control measures, a discussion on fiber laser applications, the latest information on and footage of Class 1M and 2M military lasers, updated information about the agencies that regulate safety issues, and much more.

Like its predecessor, the new version will still outline the important safety rules and regulations employees must know in the field. The 2016 edition also includes brand new footage, updated information and provides trainees and current employees with the most up-to-date knowledge needed to successfully enter the world of laser safety.

In the new edition, LSOs can even test employees' understanding of video concepts and safety information with an accompanying quiz.

With each purchase of the 2016 version of *Mastering Light*, a DVD and a digital version are included. The digital version will be available for viewing anytime at **www.lia.org**, where it will appear under the user's downloads.

No matter whether you are a Laser Safety Officer looking for the latest in reliable, updated safety information for you and your team, or you are a company seeking the most comprehensive laser safety education available, the new EVALUATOR software and *Mastering Light* DVD are for you. Each purchase of the Desktop EVALUATOR and *Mastering Light* DVD contains a single-user license. The Desktop EVALUATOR's installation key expires 90 days from day of purchase. To purchase these laser safety training tools today, visit **www.lia.org/store**. ■



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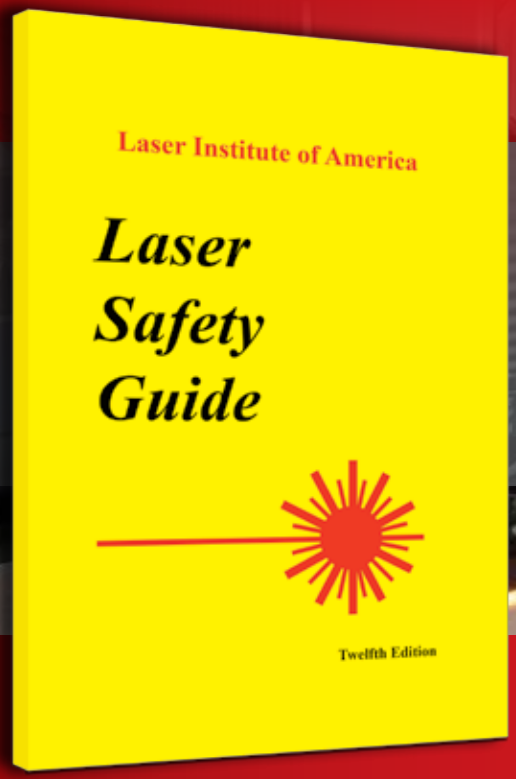
LASER SAFETY GUIDE | TWELFTH EDITION



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- Outlines potential hazards for all types of lasers
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ILSC 2017

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ILSC
INTERNATIONAL LASER SAFETY CONFERENCE

BY BETSY MARONE

Laser Institute of America (LIA) will hold its biennial International Laser Safety Conference (ILSC®) from Mar. 20-23, 2017. At the Sheraton® Atlanta Airport, LIA will gather laser safety experts from around the globe to offer a thorough and comprehensive four-day conference for a variety of laser industry members. From laser safety officers and nurses, to safety product manufacturers and laser physicists, attendees will not only gain invaluable information from sessions, but will also have the opportunity to network with others and take part in this community of laser safety experts.

In 2017, ILSC – the premiere conference in the field of laser safety – will be led by Conference General Chair John O'Hagan of the Health Protection Agency. The 2017 program will feature knowledgeable speakers and presenters in the plenary session, the poster presentation gallery, the Laser Safety Scientific Sessions (LSSS), the Medical Practical Applications Seminar (MPAS) and the Technical Practical Applications Seminar (TPAS). Co-chaired by Eddie Ciprazo and Jamie King, the focus of TPAS in 2017 will be a return to the basics.

"For the Laser Safety Officer (LSO) who is just starting out, who serves as a collateral duty, or even as a seasoned LSO with years of experience, there is something for everyone," explains King. "From basic optics to cutting edge technologies, and everything in between, it's here."

Karl Schulmeister, Chair for LSSS, assures that ILSC will continue to cover the subject matter that attendees have found most helpful over the years. Among the planned topics are laser product safety, medical laser safety, and bioeffects. The latter will expand upon the interactions between lasers and tissues, discussing injury thresholds for the varying tissues of the eye and skin. Other sessions will focus on eyewear, outdoor lasers, high

power lasers and materials processing. Broadband incoherent radiation will also be featured, as these lighting and other non-laser optical radiation sources have become interwoven with laser safety in recent years.

The ILSC 2017 Call for Papers is open for submissions. Authors are invited to submit their abstracts for oral and poster presentations by Oct. 6, 2016. Papers should contain original, recent and unpublished results of application research, development or implementation. To submit your abstract, visit **www.lia.org/conferences/ilsc/abstract_submission**.

"The authors of these submitted papers make up this scientific conference," states Schulmeister. "The quality of the conference is determined by the quality of the submitted papers as oral presentations, posters and the respective proceedings papers, which are valued sources of information not only for the participants at the conference, but as general references." ■

For more information on ILSC 2017, visit **www.lia.org/ilsc**.

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LASERVISION USA

A Global Leader in Laser Safety Products

laservision®

BY BETSY MARONE

A global leader in the manufacture and distribution of personal safety products, Laservision USA, along with its counterpart, Laservision Germany, offers customers a complete line of high-quality laser safety products that meet the highest standards of function and innovative technologies. From product design, development and manufacturing to training, service and support, Laservision addresses a full range of laser-safety needs.

Founded in 1995 as Trinity Technologies, the company joined Laservision Germany in 2006, and is owned by the UVEX Safety Group, located in Fürth, Germany. While the central product development team – which oversees the research, development, testing and certification of products – resides in Germany, each of the company's manufacturing sites house sales and marketing, with the Germany office overseeing distribution and customer service in Europe and the Middle East, and the US office responsible for North America, South America and Asia. With this global reach, Laservision is a leader in the field of laser safety, offering customers a comprehensive product line for both ANSI and CE markets.

Since the time of its inception, Laservision has produced its largest product line: laser safety eyewear. Expanding its product line soon after, the company also added education services with classroom, online and onsite training options. Today, Laservision designs, manufactures and distributes its eyewear along with a wide variety of other laser safety products, including shields, windows and barriers. With the ability to serve the worldwide laser industry and a dedication to customer service, Laservision's products and services are tailored to meet customers' specific business and safety needs. The company, recognized for its dedication, boasts a knowledgeable and highly-trained staff, including Certified Laser Safety Officers (CLSOs), who are constantly available to assist customers. From the industrial and medical industries, to research and the military, Laservision develops products and services for laser users, distributors, manufacturers and integrators in a variety of settings.

For more than 20 years, the company has developed thousands of customized laser safety filters in order to meet the needs of individuals around the globe. In addition to Laservision's wide variety of frame styles, the company also produces prescription lenses and over-the-glass frame options for bespectacled customers. A partnership between the company's highly-trained CLSOs and product development experts allows Laservision to identify and develop the proper eyewear for virtually any laser application. As a result, physicians, industrial users, military personnel and scientists in research universities and labs worldwide trust the ISO-certified company for their laser safety eyewear, which meets both ANSI and EN standards.

With the constant expansion of laser applications in industrial and medical settings, Laservision works to meet customer demands for improvements not only in laser safety protection, but also in the fit, comfort and flexibility of its products. To answer this call, the company has designed new eyewear frame styles, new coatings and new polycarbonate filters. Covering several different wavelengths, these new filters provide a broader band of coverage for customers, serve as a lightweight, cost-effective laser goggle option and prove the company's promise to providing its customers with the best laser safety options. Examples of this innovation in the science of polycarbonate injection molding include eyewear worn by pilots and law enforcement personnel in order to combat handheld laser threats, and a clear filter that protects against near-IR laser light – a job traditionally done solely with heavy glass filters.

A member of Laser Institute of America (LIA) since 1998, Laservision appreciates the organization's vast network and schedule of conferences and educational events, all of which help the company stay connected to customers, partners and stakeholders in the industry. ■

For more information, visit **www.lasersafety.com**.

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Member Innovations

Buffalo Filter Launches New, Improved PlumePen® Pro Surgical Smoke Evacuation Pencil

Buffalo Filter recently launched its new, improved PlumePen® Pro Surgical Smoke Evacuation Pencil at the AORN Surgical Conference & Expo 2016 held in Anaheim, CA April 2-6, 2016. PlumePen Pro now offers surgeons the flexibility and option of longer surgical smoke capture ports making the exchange of blades easy and plume capture tailored to the blade length.

"Our growing portfolio of surgical smoke evacuation pencils is the result of our strategic focus to add value to our procedural solutions," said Kimberly M. Addison, Director of Marketing. "The re-launch of PlumePen Pro validates our continued commitment to improve the operating room. We will continue to develop user friendly solutions that protect the ones that care for us from the hazards associated with surgical smoke inhalation and exposure."

For more information, visit **www.filtrationgroup.com**.

Precision Laser Scanning Announces Ultra-compact Polygon Scanners for High Speed Laser Scanning

Faster and more powerful lasers require faster scan rates. Polygon scanners are 10 to 100 times faster than galvanometer scanners. However, polygon scanners, with their controllers, can be very bulky, making it difficult to implement high speed laser scanning technology into small spaces.

Precision Laser Scanning announces its Gecko™ series of ultra-compact polygon scanners. Gecko's have the motor polygon assembly mounted directly to the control board and the size of the control board has been drastically reduced with application specific ICs. High efficiency allows use without a bulky heat sink. A complete motor polygon assembly with controller can be made having a footprint smaller than a credit card!

Microscopy and biomedical applications have always had size constraints. As UAVs get smaller, polygon scanners used for LIDAR must be reduced in size, weight and power consumption. Autonomous vehicles including self-driving cars may use compact polygon scanners for collision avoidance. The small size and low mass of a Gecko polygon scanner is optimum on the end of a rapidly moving robotic arm. ULTRAFAST lasers require polygon speed to fully utilize MHz pulse rates in material processing.

For more information, visit **www.precisionlaserscanning.com**.

Members In Motion

Grand Opening of the Photonics Cluster on RWTH Aachen Campus

The International Laser Technology Congress AKL'16, organized by Fraunhofer ILT, welcomed more than 500 laser technology experts and 100 scientists, business leaders and politicians to the Campus Talk during the evening event. These guests saw as property developers Landmarken AG and KPF architects officially handed Fraunhofer ILT the keys to the new Photonics Cluster building. Following the "Photonics Cluster – Tailored Light" talk, guests had the opportunity to visit the new building and take a look at its research facilities and offices.

For more information, visit **www.ilt.fraunhofer.de**.

LPW Technology Granted Queen's Award for Enterprise 2016

LPW Technology are extremely proud winners of a Queen's Award for Enterprise in International Trade 2016. The Queen's Award is the most prestigious corporate achievement that any UK business can attain and is a seal of approval for outstanding performance. Entrepreneur Dr. Phil Carroll founded high tech company LPW, producers and suppliers of metal powders and applications development used in 3D printing, just nine years ago from his kitchen table in Cheshire.

The company is now a global market leader with 60 highly skilled staff working from LPW's head office in Runcorn, Cheshire, a fast growing facility in Pittsburgh, an office in Germany, and a network of resellers around the world.

In addition to supplying high end metal powder to the additive manufacturing industry, LPW houses world leading laboratory equipment to optimize and analyse powder, and has developed a unique portfolio of products and software to increase yield and reduce risk in the AM process.

LPW's team have unrivalled knowledge in developing applications and specialist materials particularly for the high-tech aerospace, F1 and medical implant industries.

LPW's overseas sales have grown by over 300 percent during the last three years with the proportion of sales exported increasing to 70 percent of total sales.

For more information, visit **www.lpwtechnology.com**.

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The annual meeting of ASC Z136 took place on Mar. 10, 2016 at NIST Gaithersburg, MD. The weather, alleged to be "unseasonably warm" was ideal and facilitation of the event by NIST staff was spot-on.

Thursday's morning reporting began with the announcement of secretary (Jeff Pfoutz), chair and vice chair (Robert Thomas, Sheldon Zimmerman, respectively), then subcommittee chairs. Membership requests included two potential new members, two changes to organizational member representatives, and an individual stepping down due to retirement. Recently retired members Tim Hitchcock and Connon Odom were recommended for Member Emeritus status. Suggestions were made for removal of a few members who have not actively participated in member balloting over the last several years.

After review of completed and pending interpretations, Barbara Sams gave an overview of the 2015 revisions made to ASC Z136 Procedures to comply with ANSI's *Essential Requirements* (ES) as well as a summary of the 2016 ES changes. Reaccreditation of the committee was achieved and effective Feb. 29, 2016 (based on 2015 modifications); no additional changes are required to maintain compliance this calendar year.

Each subcommittee chair gave his/her respective status report. Sheldon Zimmerman (SSC-1) asked for clarity regarding how to handle definitions between the Z136.1 and the vertical standards, that is, should the same definition be presented in every document (committee consensus was yes), then refined for the specific application. He next questioned whether appendix B (the examples appendix) should be pulled from the standard as a separate document. This led to some vigorous discussion, with the matter tabled for later consideration.

Following the subcommittee status reports, several members addressed the formation of the Graphics Design Group in an effort to clarify the intent of this ad-hoc group. New business touched on member dual representation and holding semi-annual meetings.

The day ended with a number of subcommittee chairs announcing meetings scheduled in conjunction with the LSO Workshop this coming September, while members were informed that the next annual ASC Z136 meeting will be Sunday, Mar. 19, 2017 preceding ILSC.

In addition to the annual meeting, ancillary meetings were held by technical subcommittee 1 (bioeffects) and standards subcommittees 1 (*Safe Use of Lasers* – Z136.1), 4 (measurements), 8 (R&D), and 9 (manufacturing), each responsible for the development of their respective documents.

For ancillary meeting details or to join a Z136 subcommittee, apply online at **www.z136.org**.

FROM LEFT TO RIGHT: BRET ROGERS, ED KELLY, WALLY MITCHELL

ROBERT ALDRICH, CHAIR OF SSC-6 (Z136.6)

On Going

Reorganized following last year's International Laser Safety Conference (ILSC®), the CLSO Review Board and the CMLSO Review Board are working to strengthen our program. As dictated by our Bylaws, "the purpose of a review board is to establish qualifications required to sit for an exam, determine exam content, and determine certification maintenance criteria for the corresponding certification. All determinations made by a Review Board are to be reported to the Board of Commissioners."

The CLSO Review Board is revising our CLSO exam to harmonize with the ANSI Z136.1-2014 *Safe Use of Lasers* standard, while our CMLSO Review Board has been tasked to augment our CMLSO educational study materials.

On the Horizon

The BLS Board of Commissioners (BoC) will be holding its annual meeting via teleconference on May 24, 2016. The BoC functions as the administrative arm of the BLS, managing the general affairs of the corporation, with the day-to-day oversight administered by the BLS Executive Director.

The BoC meets at least once annually. In years that there is an ILSC, the BoC meeting is held in the same location. In off years, the BoC will meet via teleconference if another conducive location is not found. During the meeting, the BoC will elect Commissioners and conduct other business pending before the Board, from approval of the organization's budget to strategic planning.

Special Thanks

Members of the BLS Review Boards and Commissioners all volunteer their time and efforts to keep the BLS smoothly functioning in a positive and successful way. Our volunteers, from board members to the individual CLSO or CMLSO who agrees to proctor an exam, are steadfast in their support to the organization, and for that, we give our heartfelt thanks.

If you are a laser safety officer who wants to be recognized for your knowledge and skills, consider certification through the Board of Laser Safety, visit **www.lasersafety.org** or call us at +1.407.985.3810. If you are currently certified and would like to participate more actively in our community, contact Barbara Sams at **bsams@lasersafety.org**.

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LIA is committed to keeping the workplace safe from hazards associated with lasers. LIA formed an Alliance with the Occupational Safety and Health Administration (OSHA) to help achieve these goals.

OSHA and LIA recognize the value of establishing a collaborative relationship to foster safer and more healthful American workplaces. This Alliance provides LIA's members and others, including small businesses, with information, guidance and access to training resources that will help them protect employees' health and safety, particularly in reducing and preventing exposure to laser beam and non-beam hazards in industrial and medical workplaces. In addition, the organizations will focus on sharing information on laser regulations and standards, bioeffects lasers have on the eyes and skin, laser control measures and laser safety program administration.

US Labor Department Announces Availability of $4.6 M in Susan Harwood Safety & Health Training Grants

The US Department of Labor's Occupational Safety and Health Administration (OSHA) announced today the availability of a total of $4.6 million in funds in the Susan Harwood Training Grant Program.

The grants will fund the creation of in-person, hands-on training and educational programs and the development of materials for workers and employers in small businesses; industries with high injury, illness and fatality rates; and vulnerable workers who are underserved, have limited English proficiency or are temporary workers. The program intends to help workers and employers identify and prevent workplace safety and health hazards.

Nonprofit organizations including community and faith-based organizations, employer associations, labor unions, joint labor/management associations, Indian tribes and colleges and universities are eligible and encouraged to apply for the grants.

"Ensuring that all workers are safe on the job is a top priority for the Labor Department. The Susan Harwood training grants help to equip vulnerable workers and their employers with the information and knowledge they need to identify and prevent injuries," said US Secretary of Labor Thomas E. Perez. "The program continues the proud legacy of its namesake who did so much to understand and improve worker protections in her 17 years with the department."

The program honors the late Susan Harwood, former director of OSHA's Office of Risk Assessment, whose tenure led to the development of worker protection standards for exposure to blood borne pathogens, cotton dust, benzene, formaldehyde, asbestos and lead.

For more information, visit **www.osha.gov**.

JLA | Editor's Pick

JLA
Journal of Laser Applications

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.

Laser Surface Modification for the Prevention of Biofouling by Infection causing Escherichia Coli

BY ALICE GILLETT, DAVID WAUGH, JONATHAN LAWRENCE, MARK SWAINSON & RON DIXON

Bacteria have evolved to become proficient at adapting to both extracellular and environmental conditions, which has made it possible for them to attach and subsequently form biofilms on varying surfaces. This has resulted in major health concerns and economic burden in both hospital and industrial environments. Surfaces which prevent this bacterial fouling through their physical structure represent a key area of research for the development of antibacterial surfaces for many different environments. Laser surface treatment provides a potential candidate for the production of antibiofouling surfaces for wide ranging surface applications within healthcare and industrial disciplines. In the present study, a KrF 248 nm Excimer laser was utilized to surface pattern polyethylene terephthalate (PET). The surface topography and roughness were determined with the use of a Micromeasure 2, 3D profiler. Escherichia coli (E. coli) growth was analyzed at high shear flow using a CDC Biofilm reactor for 48 h, scanning electron microscopy was used to determine morphology and total viable counts were made. Through this work, it has been shown that the surface modification significantly influenced the distribution and morphology of the attached E. coli cells.

To continue reading more about this paper, visit **jla.aip.org**.

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Visit **www.lia.org/membership** for more information and to sign up today. This offer expires Aug. 30, 2016.

CLSOs' & CMLSOs' Best Practices Publications Reduced to Half Price - Order Today!
Two vital tools that LIA offers Laser Safety Officers (LSOs) and Medical Laser Safety Officers (MLSOs) to train their staff have both been reduced to half price for a limited time! LIA's *CLSOs' Best Practices in Laser Safety* and *CMLSOs' Best Practices in Laser Safety* offer all laser safety personnel the ability to train their staff and better facilitate the safe use of lasers in each environment.

CLSOs' Best Practices in Laser Safety concentrates on how to address Class 3B and Class 4 laser hazards and their safe operation. The book is a compendium of procedures, policies and practical advice for laser safety professionals. This handbook covers areas of laser safety practices that are typically needed in the anticipation, recognition, evaluation and control of laser hazards as well as the rules and regulations that exist. In addition, there are laser-related accident case histories with training tools and "lesson learned" sources.

CMLSOs' Best Practices in Medical Laser Safety compiles the latest knowledge for establishing a medical laser safety program, including laser safety regulations, how to control and evaluate such programs, and the duties of MLSOs. The book focuses on topics such as initial LSO duties and responsibilities, beam and non-beam hazards, and factors that determine laser tissue interaction, Contributors, BLS Certified MLSOs, also address the importance of safety audits once a laser safety program has been established. Packed with useful figures and tables, the book includes samples of a medical laser safety inspection checklist, a laser inventory sheet, a laser procedure record and laser safety audit forms.

Both books include a CD-ROM Initial Training and Refresher Training PowerPoint™ presentation for LSOs and MLSOs to use to train their facilities' laser users.

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Mark Your Calendar & Register for ICALEO 2016
Now is the time to register to attend LIA's International Congress on Applications of Lasers & Electro-Optics (ICALEO®), which will be returning to San Diego, CA on Oct. 16-20. ICALEO has a 34 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. From its inception, ICALEO has been devoted to the field of laser materials processing at macro, micro and nanoscales and is viewed as the premier source of technical information in the field.

Each year ICALEO features areas of topical interest. This year's featured sessions include diode lasers for processing and pumping, laser process monitoring and control, laser processing of biological materials, lasers in nanotechnology and environmental technology, laser hybrid processing, laser manufacturing for alternative energy sources and laser business development.

For more information and to register, visit **www.icaleo.org**.

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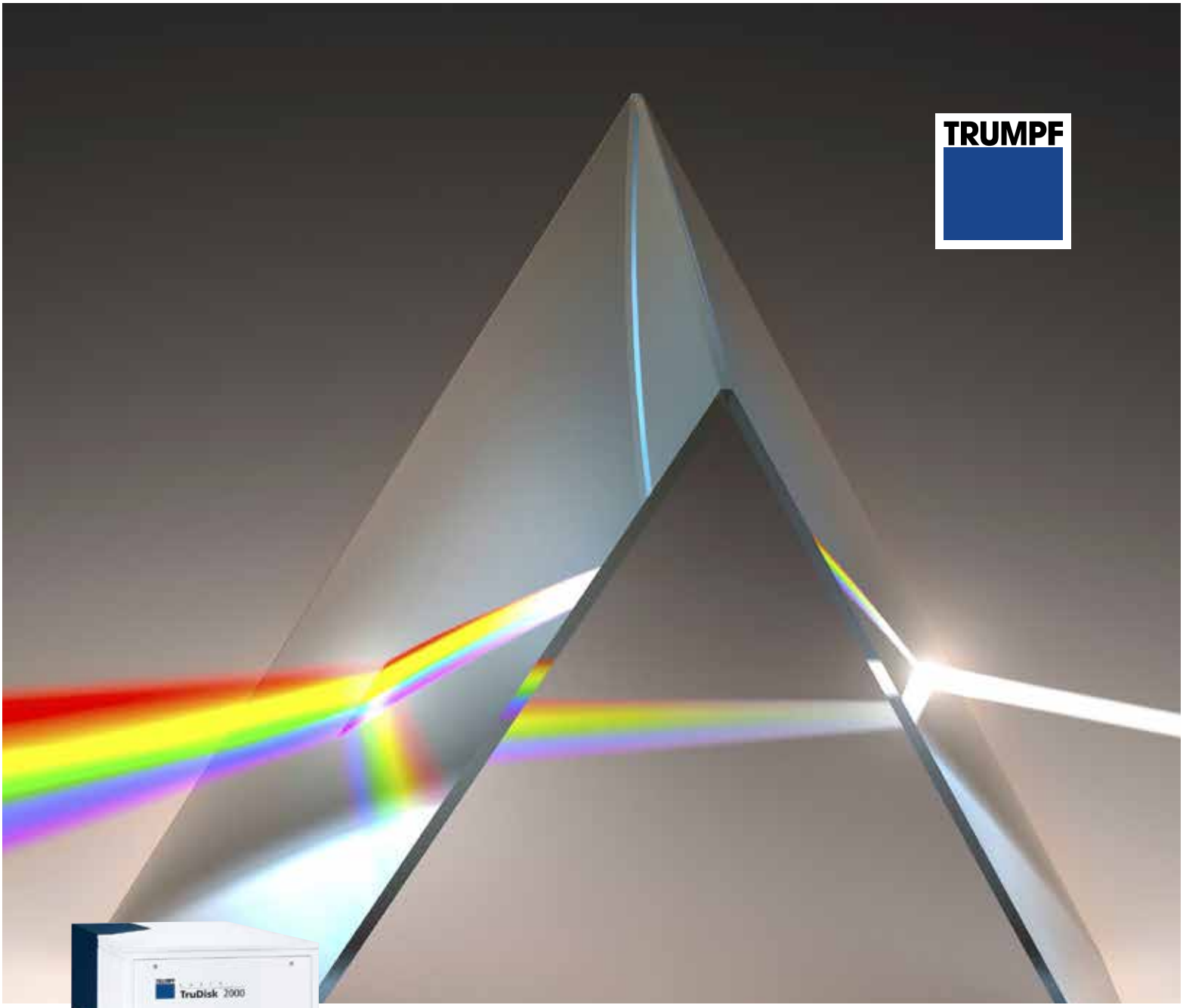
If you or your company is interested in being represented at LAM 2017, now is the time to sign up as a Vendor or Sponsor. Sponsorship is a valuable way to reach a highly-qualified target audience. Communicate directly with influential decision makers, provide solutions to technology challenges, promote brand recognition through high visibility and source new products to your target market with our exclusive packages. Don't miss this strategic opportunity for direct access to your customers! Please contact Andrew Morrison at **amorrison@lia.org** for more information.

For more information on LAM 2017, visit **www.lia.org/lam**.



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