



LIA TODAY

THE OFFICIAL NEWSLETTER OF THE LASER INSTITUTE OF AMERICA
The international society dedicated to fostering lasers, laser applications, and laser safety worldwide.

FOCUS: TRAINING | VOLUME 17 NUMBER 2 | MAR / APR 2009

HIGHLIGHTS FROM LIA'S LAM WORKSHOP

By Milan Brandt

LIA's first ever workshop on LAM (Laser Additive Manufacturing) was held in San Antonio, Texas from March 3-4. The workshop was co-chaired by Paul Denney, Connecticut Center for Advanced Technology, and James Sears, South Dakota School of Mines & Technology, and it attracted some 100 delegates from industry, academia and national labs from around the world to discuss laser cladding technology for repair and rapid manufacture of components in a range of industries including aerospace, mining, and heavy manufacture.

In his opening remarks, James Sears welcomed the attendees and outlined the aims of the workshop. The principal aim was to promote this process to industry as proven, affordable and effective when meeting their manufacturing challenges. He said that when considering the program, the emphasis was very much on practical applications of the technology rather than technical papers. *(Con't. pg. 6, see LAM)*



ALAW 2009 LASER APPLICATIONS, THE ENABLER FOR GREEN CAR BODY PRODUCTION

ALAW 2009 Laser Applications Workshop is a two-day event designed to improve productivity and reduce manufacturing costs with laser processing for manufacturers and job shops as well as automotive manufacturers and their suppliers. With the theme "Lasers... Leading the Green Revolution!", the expanded ALAW 2009 conference will focus on laser solutions for new product design and real-world manufacturing challenges. New program topics for 2009 include laser manufacturer reports, hot forming process, robotics, tier 1 laser applications success stories, fabricator roundtables and "going green and making green."

The workshop will be held at the Inn at St. John's in Plymouth, Mich. May 12-14. ALAW also features two full days of laser applications for fabricators and a golf tournament on the first day. The workshop chair is LIA Executive Director Peter Baker and conference chair emeritus is Frank DiPietro.

CONFERENCE TOPICS

The workshop opens Wednesday with a keynote presentation titled "Benchmark Automotive Production in North America" by *(Con't. pg. 8, see ALAW)*

LIA ANNOUNCES

ANSI Z136.5 Revision Now Available

LIA is proud to announce the newly revised ANSI standard, Z136.5-2009 *Safe Use of Lasers in Educational Institutions*. Originally released in 2000, this standard addresses laser safety concerns and situations characteristic of the educational environment. The updated Z136.5 has revised and expanded upon the original version to help you ensure that your lab and students are up-to-date on the most current laser safety standards.

Predominate changes to the Z136.5 include harmonization of the laser classification scheme to agree with the Z136.1-2007 *Safe Use of Lasers*, parent document of the series, and the IEC 60825-1. Another update is to the laser safety warning signs section, which has also been harmonized with the Z136.1. Other significant revisions can be seen in the laser laboratory layouts, standard operating procedures, figures, and tables. The definitions section has undergone revision as well, with some terms being redefined and the addition of many new terms and definitions. *(Con't. pg. 19)*

Inside this issue: LIA Partnership at
LASER World of Photonics pg. 10;
LIA Safety Training pg. 12



Laser Institute
of America

Laser Applications and Safety

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LIA TODAY

THE OFFICIAL NEWSLETTER OF THE LASER INSTITUTE OF AMERICA

LIA TODAY is published bimonthly and strives 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 407.380.5588, or send material by e-mail to lia@laserinstitute.org.

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CALENDAR OF EVENTS

Laser Safety Officer Training

May 13-15, 2009	Las Vegas, NV
Aug. 4-6, 2009	St. Louis, MO
Dec. 7-9, 2009	Orlando, FL

Laser Safety Officer with Hazard Analysis*

June 15-19, 2009	Washington DC
Sept. 28-Oct. 2, 2009	San Francisco, CA
Nov. 2-6, 2009	Orlando, FL

*Certified Laser Safety Officer exam offered after the course.

Medical Laser Safety Officer Training*

May 1-2, 2009	San Diego, CA
Sept. 19-20, 2009	San Francisco, CA
Nov. 14-15, 2009	New Orleans, LA

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

Advanced Medical Laser Safety Officer

Sept. 10-13, 2009	Atlanta, GA
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ALAW 2009

May 12-14, 2009	Plymouth, MI
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LASER World of Photonics Munich

June 15-18, 2009	Munich, Germany
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ICALEO® 2009

Nov. 2-5, 2009	Orlando, FL
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ABOUT LIA

Laser Institute of America (LIA), founded in 1968, is the international society for Laser Applications and Safety. It is comprised of laser researchers, manufacturers, integrators, and end users working together to increase the use and safe application of laser technologies. LIA individual and corporate members receive significant discounts on all LIA materials, training courses, and conferences.

Laser Institute of America started with the sole intention of turning the potential of a powerful new technology into a viable industry. The LIA was forged from the heart of the profession – a network of developers and engineers – people who were actually using lasers. These were the first “members” of the LIA, the people who decided that sharing new ideas about lasers is just as important as developing them. The belief, as it remains today, is to promote laser applications and their safe use through education, training, and symposia.

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FIND A JOB FILL A POSITION

Many job seekers and employers are discovering the advantages of searching online for industry jobs and for qualified candidates to fill them. But when it comes to making career connections in the field of laser technology, the mass market approach of the mega job boards may not be the best way to find exactly what you're looking for.

The **Laser Institute of America (LIA)** has created the **LIA Career Center** to give employers and job seeking professionals a better way to find one another and make that perfect career fit.

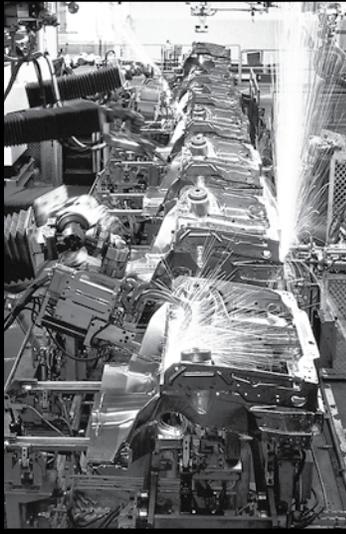


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EXECUTIVE DIRECTOR'S MESSAGE

LASERS ZAP OUR TROUBLES

I don't know about you, but I am pretty fed up with being assaulted by a steady drumbeat of bad news. At a recent meeting of society executives, the talk was of 401(k)s turning into 201(k)s, that "flat is the new up" and so on. It is hard to look at a newspaper or watch TV without absorbing more misery.



Then, from an unlikely source, the *Wall Street Journal*, (March 14-15), front page news, good news, "Rocket Scientists Shoot Down Mosquitoes with Lasers." There it is, for all to see, lasers are not a solution looking for a problem! Lasers are the solution to one of our most intractable problems, wiping out malaria, potentially saving millions of lives.

The article goes on to say that researchers "in long white coats," former Star Wars physicists and an entomologist with a Ph.D. in mosquito behavior had teamed up. Their system is able to target a mosquito and hit it with a remote laser. They can tell if a mosquito is male or female by its wing beat and could potentially kill only the females, since they, not the males, transmit malaria. It occurred to me that with today's precision we could probably just neuter the males!

So there it is. The laser industry can zap mosquitoes and it can zap a lot of the problems we face today. It's good to be in the laser industry... sure beats being in buggy whips.



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

WELL-ROUNDED WORKSHOP

The workshop was a two-day event covering all aspects of laser cladding technology and applications including laser sources, laser cladding nozzles for powder delivery, integrated laser and wire deposition heads, powder and wire alloys for wear and corrosion applications, and applications themselves. There were 24 presentations loosely grouped into laser technology, power generation, heavy manufacturing, defense, and oil and gas industry applications. In addition, there was a tabletop display showcasing a range of companies and their products and services.

I found most presentations to be informative and with an industry focus and while it is not possible to summarize them all, some deserve a mention from the point of view of an industry novice who came to the workshop to learn about the technology and its potential. The first of such presentations was by Ingomar Kelbassa from Fraunhofer ILT on "The Principles of Laser Additive Manufacture and its Role as an Enabling Technology in Future Factories." He covered in considerable depth the key components of the powder deposition technology, detailing with both the injected and pre-placed technique. He went on to describe the different types of powder delivery nozzles and the role ILT plays as the supplier of such nozzles. This was followed by a number of examples of laser cladding as a repair technique in the aerospace, tooling, and ship building industry.

The presentations by Roland Gassmann, Praxair Laser Services, Dan Hayden, Hayden Laser Services and Wim Husslage, NedClad Technology were typical of the presentations on application of laser cladding for the repair of a range of components in the power generation, oil and gas, and heavy manufacture industries. The presentations covered in-depth the components, their wear or corrosion issues, and why laser cladding was the optimum solution both from the material point of view and cost of repair.

The presentations by Wayne Penn, Alabama Laser and Scott Boynton, Joining Technologies discussed, from the system integrators point of view, some of the challenges relating to the integration of laser, powder nozzles, motion systems and controls required for optimum process results. The presentation by Silke Pflüger, Laserline and Keith Parker, Coherent discussed the diode laser technology as one of the laser sources used for laser cladding and additive manufacture.



The well attended opening session kicked off LAM 2009.

Then, the presentation by Bhaskar Dutta, POM; Richard Gryllis, Optomec, and Christian Foehl, Trumpf described and discussed the other solution for companies interested in acquiring laser repair technology, the turn-key systems.

Finally, Thierry Marchione, Technogenia, presented information on the manufacture of powders for laser cladding, in particular tungsten carbide used in metal matrix composites for wear applications. He also presented some data on the growth of companies in North America involved in laser cladding/repair in the various sectors. Figure 1 shows that the number of companies involved in laser cladding/repair since 1995 has increased by a factor of 6 and Figure 2 shows the distribution as a percentage across different industry sectors.

WORKSHOP THAT WORKED

Overall the workshop was a great success both in terms of its aims and the high level of industry interest shown. Paul Denney, Jim Sears and the LIA should be congratulated on a job well done. The bringing together of industry and practitioners of laser cladding technology in one forum is, in my opinion, the way forward for its greater adoption as the technology of choice for a range of wear, corrosion and rapid manufacture problems experienced by various industry sectors. The workshop has also highlighted the success of this type of format and I hope to see more of these forums in the future. ■

LIA board member Milan Brandt is a professor of laser engineering with the Industrial Research Institute Swinburne, Swinburne University of Technology, Melbourne, Australia.

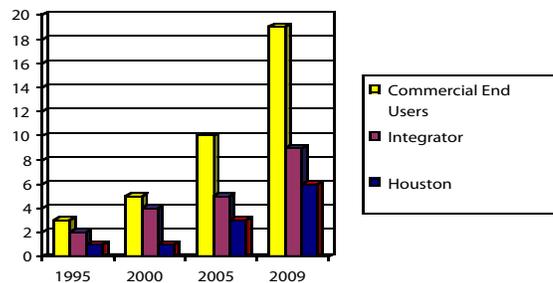


Figure 1. Number of end users, integrators and Houston-based companies involved in laser cladding/repair.

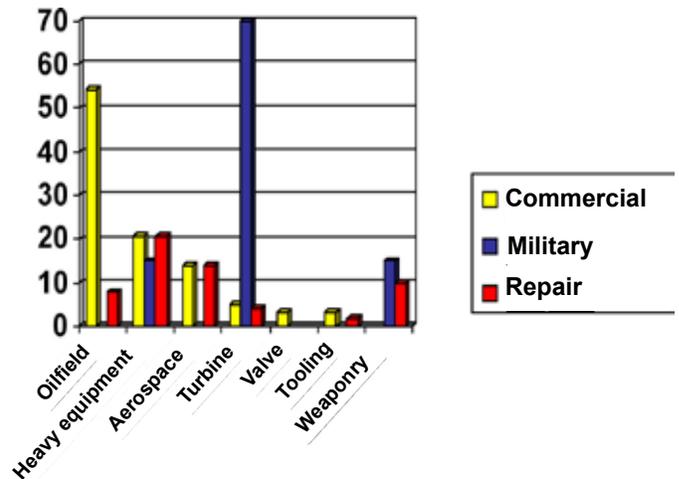


Figure 2. Percentage of laser cladding/repair activity across different industry sectors.



LAM's exhibitor reception was a great opportunity for attendees to learn about equipment and applications in an informal atmosphere.



Exhibitors such as Preco, IPG Photonics, and Joining Technologies were on hand to inform attendees of their products.



Networking luncheons were held both days of LAM.



The workshop proved to have a well-rounded lineup of educational material for all attendees.



LIA's Jim Naugle presenting LAM co-chairs Paul Denny, left; and Jim Sears, right, with their appreciation plaques.

MANY THANKS TO THE LAM 2009 SPONSORS:

- Alabama Laser
- IPG Photonics
- Laserline
- Joining Technologies
- Huffman Corporation
- Coherent
- Precision Optical Manufacturing
- Fraunhofer USA



Fabricators & Manufacturers
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ALAW 2009



Laser Institute of America
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LASER APPLICATIONS WORKSHOP 2009

Michelle Hill of Oliver Wyman. Thursday's keynote presentation, titled "Energy Efficient Car Body Production," will be presented by Matthias Putz of Fraunhofer IWU.

At the event, automotive manufacturers, laser integrators, and tier 1 and 2 suppliers from the global automotive industry will deliver presentations and offer solutions on laser processing for automotive components, diode, fiber, and disk laser applications for welding and cutting, and how lasers are being used worldwide in the automotive industry.

The automotive track includes remote laser welding with solid-state lasers, trends and new developments in fuel cells and batteries, laser processing of high performance materials, aerospace manufacturing techniques, case studies, and laser system integrators. Body in white sessions cover laser cutting, remote welding, new applications, beam delivery/sensing, industrial laser beam welding of hard-to-weld materials, manufacturer reports, and new products and trends from several top laser manufacturers.

Topics in the lasers for fabricators track include steel for laser cutting, effective sales techniques for the metal fab shop, going green and reducing energy costs, what's new in fiber laser applications for the fabricator, workflow across lasers, part preparation, a cost estimating exercise, cutting diversity, case studies, and roundtable discussions.

WHO SHOULD ATTEND?

ALAW draws over 200 attendees from automotive manufacturers, laser integrators, tier 1 and 2 suppliers and laser job shops. The automotive sessions of ALAW should be attended by manufacturing, production, product design and research/development engineers and anybody interested in using and/or developing flexible applications for automotive laser material processing systems to reduce costs, improve quality and provide flexible laser manufacturing.

The fabricators sessions of ALAW should be attended by owners, managers, supervisors of fabrication and job shops as well as new end-users who want to learn more about the benefits of using laser technology for new or different applications and the associated costs.

REGISTRATION

Workshop attendees can register to attend the full conference or just one day. Full registration includes admission to all plenary and technical sessions, exhibits, the Exhibitor Reception, breakfasts, luncheons, and breaks. A one-day registration allows entrance to only that day's events. An early bird discount is given to those registering at least five weeks out from the workshop. There is an additional fee for the golf outing that is being held on Tuesday, May 12. You can register online at www.alawlaser.org/registration. ■

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LASER APPLICATIONS WORKSHOP

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"The 2009 ALAW conference was extremely informative. I highly recommend it to the automotive design engineer, welding engineer, or advanced manufacturing engineer interested in pursuing laser processing in the future."
-David Reed, Light Weight Body Supervisor, Chrysler LLC

For more information
about ALAW 2009 and
the most up-to-date
program, visit www.alawlaser.org/program.html.

ALAW OPEN HOUSES

All ALAW attendees are invited to the open houses being held in conjunction with ALAW. The first is being held by Fraunhofer Center for Laser Technology on Tuesday, May 12.

Fraunhofer partners with universities to develop and design novel laser systems and components.

Trumpf Inc. Laser Technology Center will be holding its open house on Thursday, May 14.

TRUMPF Group is a world market and technology leader in the area of industrial lasers and laser systems. The product line includes laser cutting and welding systems for flat and 3D parts, high-powered CO₂ lasers, lamp- and diode-pumped solid-state lasers, as well as marking lasers and systems.



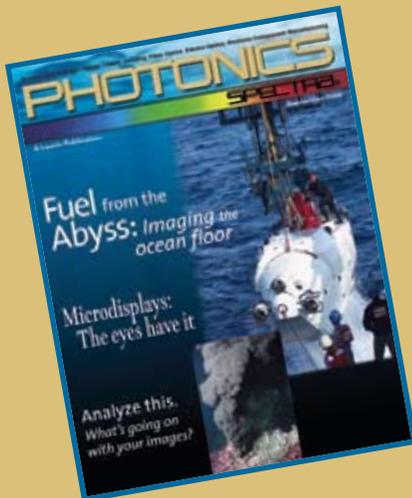
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LIA Partners with Messe Munchen International at LASER World of PHOTONICS 2009

LASER World of PHOTONICS 2009 and the World of Photonics Congress, which will be held June 15-18 in Munich, Germany, is the international trade fair and congress for optical technologies – components, systems and applications. At this congress, science and industry will present the technology and

“This partnership allows LIA to build a stronger foundation in Europe, joining many other leading organizations in the field of photonics,” says LIA’s Marketing Director Jim Naugle. “It also provides LIA an opportunity we haven’t had in the past, to look for new opportunities to better service our members abroad.”

LASER World of PHOTONICS

solutions they have most recently developed. No other exhibition brings together more innovations, applications and know-how, and provides more comprehensive answers to questions regarding efficient, optimized processes and increased productivity.

LASER World of Photonics is the world’s leading tradeshow for optical technologies and has taken place every other year since 1973 in Munich. The event is held in parallel with the World of Photonics Congress, which is Europe’s largest photonics congress and is organized in cooperation with the world’s leading organizations in this field. LIA is one of these organizations and will be partnering with Messe Munchen International to help promote the trade fair and the conferences associated with it.

As part of the partnership, LIA will have a 12 square meter booth. Stop by and see us at Hall B1, booth #645.

BONUS BIOPHOTONICS

The tradeshow and the congress have also expanded their offerings for biophotonics and life sciences. For the first time, the tradeshow is setting up an exhibition focus area dedicated to the subject of biophotonics. How can cancerous tumors be reliably diagnosed and treated without performing surgery? How can effective new cures be developed? How can water quality be monitored efficiently? Biophotonics delivers answers to these diverse and pressing questions in medicine, biotechnology and environmental technology.

Within the framework of a joint booth or a booth of their own, research institutes, developers and manufacturers of optical and photonic methods and processes can provide insights into their biophotonic technologies. The broad-ranging areas of application include dentistry, dermatology and urology, molecular diagnostics, innovative drug-delivery technologies, the monitoring of bodies of water and the processing of drinking water.

In the interdisciplinary “Visions for Future Diagnostics” workshops, which are being held at no extra charge, medical professionals will be presenting the challenges they are facing, particularly in the areas of oncology, diagnostics and infectious diseases. Industry representatives will be presenting the status of the latest technology. Then, together with scientists, the participants will be developing potential problem-solving approaches that are based on biophotonic methods and technologies. In this way, they will be laying a foundation for future developments in biophotonics.

For more information visit www.world-of-photonics.net. ■

LIA AT LIM 2009

Lasers in Manufacturing (LiM 2009) will be held in Munich, Germany from June 15-18 in conjunction with the 19th International Congress on Photonics in Europe. LIA will be a cooperating society for this technical conference as LiM 2009 is an ideal platform for gathering information on the latest developments and for exchanging ideas between both industry and research. For more information visit www.laser-zentrum-hannover.de/en/lim2009-wlt/.

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NEW MUNICH
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Timely Topics From ILSC®

The world's leading conference on laser safety was held in March in Reno, Nev. Presented by LIA, the International Laser Safety Conference (ILSC®) was a comprehensive four-day conference covering all aspects of laser safety practice and hazard control. Laser safety experts from around the world descended on Reno to discuss the latest changes to regulations and common practices in the field. At press time, this conference was taking place, but here's a preview of the knowledge-packed sessions attendees were treated to regarding what's new in laser safety.

SAFETY CONSIDERATIONS (NON-BEAM, FUME EXTRACTION)

Revised Non-beam Hazard Section in ANSI Z136.1 by Gene Moss, Corning Inc., Corning, NY, Ben Edwards, Duke University, Durham, NC, and Tom Tierney, Lanl, Los Alamos, NM

The ASC Z136 Non-Beam Hazards (NBH) Technical Subcommittee has proposed revision of the NBH section in the Z136.1 standard for the *Safe Use of Lasers*. Factors motivating these changes include: a) the number of NBH have tripled in the last decade, b) NBH tend to incur greater regulatory compliance burdens and consequences than beam hazards, c) NBH remain the leading cause of laser-related incidents, d) NBH can extend beyond the NHZ, e) unlike beam hazards, NBH have produced fatalities, f) new laser technologies and applications have increased the potential newer NBH concerns.

In order that laser safety professionals and institutions may better address the concerns raised by NBH issues, this revision includes: a) clarification of the NBH definition to more explicitly delineate NBH from other hazards that, though serious, are not associated with the laser system and therefore resides outside of a laser safety standard's scope. b) revision of the sections addressing exposure to laser generated ionizing radiation (LGIR). c) information on the recognition and control of laser generated nanoparticles. d) greater emphasis on the need to better contain laser generated air contaminants (LGAC). e) guidance regarding the potential ignition source hazard from lower class lasers. The subcommittee believes these proposed changes will help to ensure an appropriate and expanded coverage of existing and future laser NBH concerns.

HAZARD & RISK ASSESSMENT I

Scanning Audiences at Laser Shows: Theory and Practice, by Greg Makhov, Lighting Systems Design Inc., Orlando, FL and Patrick Murphy, International Laser Display Assn., Orlando, FL

For more than three decades, the technique of "audience scanning" has been routinely used at laser light shows outside of the United States. Visible beams from CW lasers are projected towards viewers, to put them inside cones, fans and other moving light shapes set to music. Most commonly, accessible irradiance levels have not been measured by operators; instead they have been set by eye to look "OK." Since maximum permissible exposure (MPE)-level irradiance at the audience is somewhat

less bright than desired, most shows have exceeded the MPE. Estimates of the irradiance levels range from 10 times to 100 times the MPE, or more. Despite this, there have been remarkably few proven or even claimed reports of injuries from deliberate audience scanning, given this widespread practice. A number of possible reasons are presented, including high divergence lasers, short duration of exposure, and viewers who actively take action to reduce exposure.

Audience-scanning lasers are often found in venues such as discos where patrons enjoy riskier-than-normal activities. This includes hearing-damaging sound levels, alcohol consumption (sometimes to excess), smoking, and even potential consumption of illegal drugs. Patrons self-manage the risk; they can move farther from the speakers or use earplugs; they can avoid alcohol, smoking etc. Similarly, if an audience-scanning show is uncomfortable and/or above the MPE, patrons can and do avoid direct exposure by glancing away, blinking, blocking the direct beam, moving farther from the lasers, etc. This is one of the reasons why there have been so few injury reports in the past 30 years.

However, there are too many shows that are far in excess of the MPE. ILDA therefore proposes changes it believes would significantly increase safety, while still allowing crowd-pleasing brightness levels. All shows would be required to accurately measure their irradiance. Shows below the MPE would remain legal as they are now. Shows up to 10 times the MPE would be permissible if the audience was cautioned via signs and announcements (e.g., "Extra-bright lasers are in use; avoid direct eye exposure"), if scan-fail circuits are used, and if show producers accept stricter liability. Shows greater than 10 times the MPE would no longer be allowed. It is expected that conservative venues (corporate shows, theme parks) would remain with current below-the-MPE shows, while discos, nightclubs and rock concerts would prefer brighter, more exciting "10x" shows. ■

Stay tuned to the May/June issue of the LIA TODAY for more details of the world's leading conference on laser safety.



INTERNATIONAL LASER
SAFETY CONFERENCE

LIA – Your Laser Safety Authority

The Laser Institute of America (LIA) is committed to keeping the workplace safe from hazards associated with lasers and therefore offers a complete line of laser safety training courses, technical information and networking opportunities for personnel in research, industrial, and medical laser facilities around the globe. All of LIA's courses are based on the ANSI Z136 series of laser safety standards, of which LIA is the secretariat.

LIA's joined alliance with the Occupational Safety and Health Administration (OSHA) helps achieve these safety goals. LIA works with OSHA to provide expertise to develop training and education programs for OSHA staff, laser manufacturers and laser users of Class 3B and 4 lasers.



LEADING WITH EXPERIENCE

LIA has been delivering quality, trusted laser safety training for over 40 years. Advantages of LIA's laser safety training courses are:

- LIA trains more laser safety officers (LSO) and laser users than anybody else in the world.
- LIA only uses the foremost experts in lasers and laser safety to develop and conduct its training courses.
- As the leading publisher of laser safety information, LIA has developed an extensive library of laser safety reference materials and training guides in traditional print format and electronically as well as online training.
- Every course attendee receives a certificate of completion from LIA showing your organization's commitment to laser safety.
- LIA's network of laser safety professionals guarantees continued support in the future.

TRAINING COURSES

LIA offers a variety of LSO training. All personnel involved with industrial, military, educational or research applications of lasers should take either the Laser Safety Officer course or the Laser Safety Officer with Hazard Analysis course. These courses are tailored to fit the needs of safety professionals, engineers, laser operators, technicians, and other professionals assigned the duties of LSO. Both courses will cover information on lasers and optics, bioeffects, beam and non-beam hazards, control measures

and training requirements. If you are required to perform laser hazard analysis calculations, you should attend LIA's Laser Safety Officer with Hazard Analysis course.

Additionally, the Advanced Laser Safety Officer course is designed for engineers, scientists, and safety professionals who are assigned LSO duties and responsibilities. Individuals working in research and development centers, universities, or manufacturing environments that desire an in-depth, expert knowledge of laser safety issues and calculations will benefit greatly from this course.

The Medical Laser Safety Officer course is designed to give operating room personnel a basic foundation in laser biophysics and tissue interaction. Laser safety protocols will be addressed according to the ANSI Z136.3 *Safe Use of Lasers in Health Care Facilities* standard. The Advanced Medical Laser Safety Officer with Hands-On Demonstration course is designed to provide MLSOs an in-depth and thorough look at laser biophysics, tissue interaction, laser delivery systems followed with a hands-on demonstration on multiple laser systems, surgical smoke plume management, anesthesia protocols, laser safety protocols according to the ANSI Z136.3 *Safe Use of Lasers in Health Care Facilities* standard, and laser safety program management and audits.

AVAILABLE ONLINE

To further help you stay on the leading edge of safety training and advancement, most of LIA's LSO courses are now available online. Additional online courses include Laser Safety Training for Physicians (to give physicians using lasers in a surgical environment the basics of laser safety), Industrial Laser Safety (addresses the concepts and basic safety concerns involved with laser materials processing), and Laser Safety in Educational Institutions (discusses the basics of lasers, bio-physics, laser safety standards, control measures, accident scenarios, and sample lab settings that are used in educational institutions).

COMES TO YOU

With its wide range of expert instructors, LIA can effectively and efficiently meet the training requirements of your organization through its onsite and in-service training. In-house teachings can cover everything from basic laser safety awareness to medical hands-on skills validation to lab safety. Onsite training is available by contacting the LIA.

LIA's medical and industrial auditing services is another way LIA can be of service to your organization. For medical facilities, LIA's auditing will assist you to be in compliance with ANSI Z136.3 *Safe Use of Lasers in Health Care Facilities* and also help you become compliant/prepared for JCAHO and OSHA inspections while the industrial program is designed to

assist facilities to be in compliance with ANSI Z136.1 *Safe Use of Lasers* laser safety standard.

So, come to the leading laser safety source and get your laser safety training from your society, the LIA, publisher of the ANSI Z136 series of laser safety standards. And if you're not an LIA member, you should be. All LIA members receive discounts on any of our industry-leading courses. LIA is your laser safety authority! Visit www.laserinstitute.org or call 1-800-34-LASER to get your training started. ■



LIA offers many valuable laser safety training opportunities.

2009 LASER SAFETY TRAINING CATALOG

LIA's 2009 *Laser Safety Training Catalog* is a handy reference of all of the society's training opportunities. To download a copy, visit www.laserinstitute.org.



LASER SAFETY OFFICER TRAINING ONLINE

The official LSO course from the Laser Institute of America, publisher of the ANSI Z136 series of laser safety standards.

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CORPORATE MEMBER PROFILE

FIBERGUIDE INDUSTRIES

With corporate headquarters and fiber manufacturing facilities located in Stirling, New Jersey and engineering and component manufacturing in Caldwell, Idaho, LIA corporate member Fiberguide Industries has established itself as a world leading manufacturer and supplier of specialty optical fibers, optical fiber assemblies and discrete components. Since 1977, Fiberguide Industries has been a fiber optic solutions company providing design, product and process development, prototyping and beta trials and volume production for applications such as laser delivery systems, ophthalmology, remote sensing (UV to IR), combined optical/CE arrays, tissue ablation/cauterization, dental, Raman scattering & spectroscopy, evanescent wave modification and sensing, and more.

The company's goal is to engineer, design, develop and manufacture the highest quality, most cost-effective optical fiber and optical fiber-based solutions for a diverse OEM market through the integration of people, technology and business systems.

PRODUCTION AND MANUFACTURING

Fiberguide's fiber manufacturing facility has several draw towers capable of producing multimode step index, graded index and single mode fibers at a rate of more than 150,000 meters of fiber each day. Each fiber is drawn from the highest quality, pure silica pre-forms to exacting standards and tested to meet customers' needs for maximum quality. Most standard fiber sizes are available from stock.

In 2001, Fiberguide Industries opened a new 27,000 square foot vertically integrated manufacturing facility in Caldwell. The plant is equipped with a state-of-the-art machine shop, multiple clean rooms, an in-house engineering department, and highly precise testing equipment.

Additionally, the company has a dedicated staff of engineers to help in the design and production of OEM or customized optical assembly. Utilizing the latest CAD software and years of experience, the company's engineers are a fantastic resource in the development of an optical solution for clients. Fiberguide's testing capabilities are based in ISO 9000:2000 standards.

THROUGH THE YEARS

Since 1977 Fiberguide has reached several milestones. For instance, in 1988 the company acquired Highlight Fiberoptics. In 1991 Fiberguide introduced continuous length aluminum and gold buffered fiber and in 1993 patented a fiber optic cylindrical diffuser for use in delivery systems. Five years later 2-dimensional

array for high-density optical switching was launched and a year after that Fiberguide received another patent for Solarguide 193™ as a solarization resistant fiber.

In the 2000s the company developed a line of hard clad silica and hard clad silica fibers, presented a line of silica v-grooves and v-groove arrays, and fused end bundles for high temperature applications and high temperature cables. In total Fiberguide has nine patents.

FUTURE OUTLOOK

In the fall of 2008 Fiberguide Industries was acquired by sensor, safety and technology group Halma p.l.c. Halma is a worldwide group of 40 manufacturing businesses operating in 26 countries with a turnover of \$700m. Fiberguide management will retain existing responsibilities, but will now have collaborative opportunities with Halma's network of photonics equipment suppliers and manufacturers to promote future growth and product innovation.

Fiberguide President Ted Rich said, "We are energized by Halma's acquisition and their reach into the global markets. Fiberguide now has access to Halma's global resources to further drive new product introductions and to meet the needs of our customers. We also expect to benefit from numerous cross-selling opportunities and to access Halma's distribution channels throughout the world."

Andrew Williams, Halma chief executive said, "Fiberguide deepens our presence within the growing photonics market and strengthens our existing fiber optic assembly activities. There are excellent opportunities for Fiberguide to develop strongly within Halma – particularly through technical collaboration with other Halma photonics companies such as Ocean Optics and Labsphere."

For more information, visit www.fiberguide.com. ■



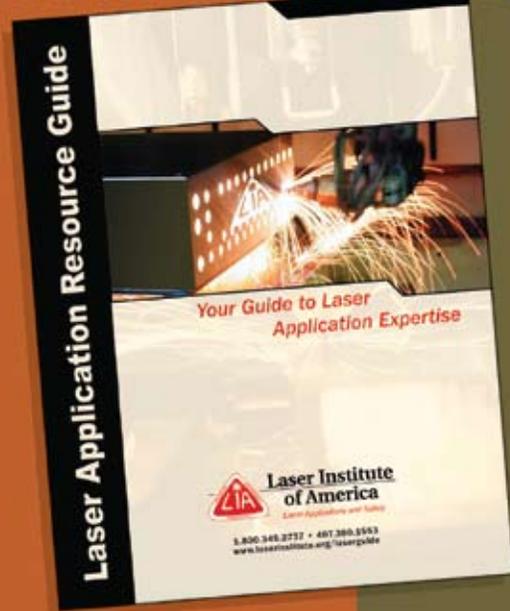
JLA UPDATE

The *Journal of Laser Applications*[®] offers the latest refereed papers by leading researchers in the laser community. The May 2009 issue includes papers from materials processing and biomedical. Look for the online version at www.laserinstitute.org/publications/jla/. To view the journal online, please make sure your membership is current. Online figures have been in color since the August 2007 issue. In addition, articles will now be posted online as the production cycle is completed ensuring timely publication. These articles will be fully citable.

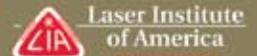
The JLA is published four times a year by the Laser Institute of America in February, May, August and November. It is sent to all LIA members as a member benefit. For nonmembers of LIA, call the American Institute of Physics at 1-800-344-6902 for subscription information.

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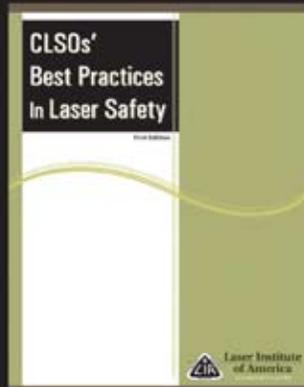
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CORPORATE MEMBERS

- Hayden Laser Services, West Springfield, MA
- Huffman Corporation, Clover, SC

For a complete list of corporate members, visit our corporate directory at www.laserinstitute.org.

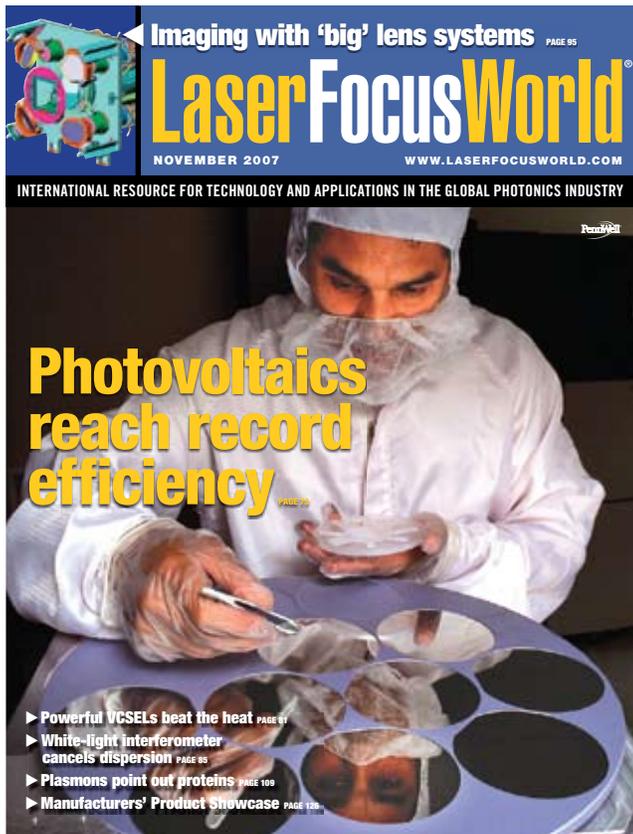
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Shad Skarich, La Verne, CA
Rao Goriparthi, S. San Francisco, CA
Brad Short, Santa Barbara, CA
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Rob Camper, Stuart, FL
Morris Hall, Pocatello, ID
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Chandraika Sugrim, Duncan, SC
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Thierry Marchione, Edgewood, TX
Patricia Holland, Katy, TX

Felicia Weatheress, Katy, TX
Sherri Long, Plano, TX
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MEMBER INNOVATIONS

COHERENT RELEASES VERDI LASER

Coherent Inc., Santa Clara, Calif., has launched an infrared version of the company's award-winning Verdi™ family of solid-state lasers, delivering 25 Watts of single-mode CW output at 1064 nm. The new Verdi IR 25 laser has the same diode-pumped, solid-state (Nd:YVO4) unidirectional ring-resonator design as is standard in all industry-leading green Verdi lasers. Applications for the Verdi IR 25 include optical trapping of atoms, where its low noise and mode-hop-free operation enables atom trapping for extended times. Other applications include optical tweezers, optical/semiconductor material development and remote optical sensing. For more information, visit www.Coherent.com.

ANALYSIS SOFTWARE INTRODUCED

Ophir-Spiricon, Logan, Utah, has introduced the latest version of LBA, the company's high accuracy laser beam analysis software. LBA measurement precision is based on Ultracal™, the company's patented, baseline correction algorithm that helped establish the ISO 11146-3 standard for beam measurement accuracy. Ultracal ensures the highest accuracy and reliability in the industry by retaining negative signals essential for making correct beam width measurements and for extracting weak signals out of noise. LBA also features a pointing stability program that collects centroid and peak data

from the LBA core system and displays it graphically. For more information, visit www.ophir-spiricon.com.

GREEN FIBER LASERS INTRODUCED

IPG Photonics, Oxford, Mass., has developed two new families of fiber lasers in the green spectrum range that will allow the company to enter new markets and applications. At output wavelengths of 532 nm, the new pulsed 10 W green fiber laser and continuous wave (CW) 15 W green fiber laser provide high single-mode beam quality, ease of use and at lower prices than competitive green lasers. These newest lasers are a direct result of combining IPG's advanced fiber laser platform with the latest state-of-the-art technologies of seed sources and nonlinear converters. For more information, visit www.ipgphotonics.com.

BEAM POWER MEASUREMENT

The PocketMonitor is a compact, laser power measurement device for use in harsh production environments. PocketMonitor's rugged aluminum housing protects electronic components against shock and humidity, and its fold-closed design further minimizes the chance of damage. Six different Pocket Monitors are now available in specific power ranges from 1 W to 12,000 W. The on-board lithium cell powers the PocketMonitor for approximately 10,000 measurement cycles before requiring replacement. For more information, visit www.lasermech.com. ■

CERTIFICATION for Laser Safety Officers

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- Achieve recognition

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CLSO
Certified Laser Safety Officer
Intended for professionals who are working with lasers in a scientific, manufacturing, or industrial environment.

CMLSO
Certified Medical Laser Safety Officer™
Intended for professionals who are working with lasers in any medical environment.

MEMBERS IN MOTION

LASER MECHANISMS RELOCATES HEADQUARTERS

After nearly 20 years in Farmington Hills, Mich., Laser Mechanisms has relocated its corporate headquarters to nearby Novi, Mich. The 22,000-square-foot facility houses corporate offices, sales and engineering. In addition, an adjacent 28,000-square-foot building is being completed for manufacturing and warehousing operations. The two facilities together will nearly double Laser Mechanisms' previous square footage. The relocation is in direct response to sustained sales growth and will enable Laser Mechanisms to more effectively serve its expanding customer base.

IPG OPENS NEW CENTER

IPG Photonics Corporation, Oxford, Mass., a leader in high-power fiber lasers and amplifiers, announced a new 8,000-square-foot Laser Micro Processing Applications Facility that will serve West Coast customers. The facility will concentrate on the advancement of laser micro processing for the photovoltaic and medical device industries. Located in Santa Clara, Calif., the heart of Silicon Valley, it will also work with IPG's other applications facilities around the world including Oxford, Mass.; Novi, Mich.; Yokohama-shi, Japan; Moscow, Russia; Daejeon, Korea; Beijing, China; Milan, Italy, and Burbach, Germany.

NEWPORT OFFERS PROGRAMS

Newport Corporation, Irvine, Calif., has introduced a new promotional campaign known as "The Right Solutions. The Right Price. Right Now". The program is designed to highlight Newport's newly broadened offering of photonic products and solutions, new incentive programs, and the company's commitment to shortened lead times to support customer needs. The new rewards programs offer various levels of incentive, depending on customer specifications, product performance parameters, and pricing needs.

Gary Spiegel, vice president of Worldwide Sales & Service for Newport said, "Newport is now offering its comprehensive selection of photonics components, systems and solutions at varying price levels to help our customers innovate, while making efficient use of their limited budgets. We are also offering a guaranteed delivery on a very broad range of products."

The innovative promotional campaign also includes The Newport Rewards Program, designed to help stretch the researchers' budgets by offering Photonics Product Certificates (PPCs). These certificates can be redeemed for subsequent product purchases online or used in conjunction with traditional purchases on a full range of Newport products. For more information, visit www.newport.com/RightNow2009.

LZH FIGHTS PRESBYOPIA

Laser Zentrum Hannover (LZH), Hannover, together with the Laserforum in Cologne and the Eye Clinic in Bonn, all in Germany, have carried out first studies to find a way to increase the flexibility of the eye lens as millions of people suffer from presbyopia, the aging of the eye lens. When natural aging occurs, the eye lens becomes less elastic, making it difficult for the lens to accommodate to different distances. Investigations from the last few years at the LZH have shown a laser can be used to cut fine grooves in the eye lens. The grooves form gliding planes in the tissue of the lens and can restore elasticity. A femtosecond laser (fs laser) is used, which is not only extremely precise, but makes very fine cut grooves. Since the size and position of the lens differ from patient to patient, control and monitoring of the cutting is done via optical coherence tomography (OCT).

More than 200 pig eyes and over 40 human autopsy lenses were successfully treated in vitro using laser technology. Cut configuration and the laser parameters were optimized to retain the biomechanics of the lens. Furthermore, some animal lenses were also treated in vivo.

Investigations have shown that light reflexes due to the cutting pattern appear immediately after treatment, but later disappear. Other investigations on long-term complications, especially concerning cataracts and clouding of the lens, have not yet been completed, but are positive in tendency. The fibers of human eye lenses are in principal similar in size and structure to the animal lenses that were treated. However, whether it is possible to use fs laser technology for treating presbyopia without causing clouding of the lens is still subject to further testing. In summary, the results already achieved are so positive that there is a very promising outlook on the future treatment of presbyopia using laser technology. ■

The Standard Has Been Set!

REVISED ANSI Z136.1

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Get your copy of the revised ANSI Z136.1 *Safe Use of Lasers*. The ANSI Z136.1 is the foundation of laser safety programs for industrial, medical, military, and educational applications nationwide and is the parent document and cornerstone of the Z136 series of laser safety standards. The standard is recognized and used by OSHA as the authoritative document for laser safety. All previous versions of this standard are obsolete (1986, 1993, 2000).



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Laser Applications and Safety

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From elementary science fair projects, to high school physics experiments, to university labs – this Z136.5 includes the recommended safety practices for instructors and students alike. The new standard can be purchased online at www.laserinstitute.org/store or by calling 800.34.LASER. The standard is also available in electronic format.



UPCOMING TRAINING COURSES

The LIA will be holding a Medical Laser Safety Officer course May 1-2, 2009 in San Diego, Calif. This course is intended for professionals working with lasers in any medical environment and is designed to give the operating room personnel a basic foundation in laser biophysics, tissue interaction and laser safety.

There is an optional Certified Medical Laser Safety Officer exam offered by the Board of Laser Safety (BLS) at the end of this course. To be able to take the exam you must apply to the BLS (www.lasersafety.org) and meet specific requirements. There is an additional fee for this exam.

LIA will also be holding a Laser Safety Officer (LSO) course May 13-15, 2009 in Las Vegas, Nev. This course is a non-mathematical approach designed to teach the duties of the LSO as described in the ANSI Z136.1 *Safe Use of Lasers* standard. Information on lasers and optics, bioeffects, beam and non-beam hazards, control measures and training requirements are covered with an emphasis placed on laser safety program development and administration. Visit www.laserinstitute.org/education for more information on either course, or contact Gus Anibarro at gus@laserinstitute.org.

ICALEO CALL FOR PAPERS

A call for papers has been announced for the 28th International Congress on Applications of Lasers & Electro-Optics (ICALEO® 2009), which will be held Nov. 2-5 in Orlando, Fla. ICALEO 2009 will include three conferences – the Laser Materials Processing Conference, the Laser Microprocessing Conference, and the Nanomanufacturing Conference – as well as a Poster Presentation Gallery, the Laser Solutions Short Courses, a Business Development Session and plenty of networking opportunities. Topics to be covered include processes such as rapid prototyping, surface modification and cutting and drilling, lasers including diode-pumped and advanced laser sources, applications in energy, biomanufacturing, nanoelectronics, information technology and education, and laser sources.

Submitted abstracts should contain original, recent, unpublished results of application research, development, or

implementation.

For complete details on ICALEO and also for sponsorship information, visit www.icaleo.org; call 800.34.LASER, or e-mail conferences@laserinstitute.org.

2009 LIA CORPORATE MEMBERSHIP DIRECTORY – COMING SOON!

The LIA is putting the finishing touches on the 2009 *Corporate Membership Directory*, which will be available in print as well as online. The annual *Corporate Membership Directory* is a comprehensive index of LIA's corporate members that includes contact information and a description of each company. The directory is distributed free-of-charge to more than 5,000 potential customers each year. Don't miss out on all of the great products and services LIA corporate members have to offer! ■



LIA SEEKING NOMINATIONS

The Laser Institute of America needs the help of its membership with nominations for officers for the year 2010 and board members for years 2010-2012, as well as for 2010 fellows and award recipients. Visit the LIA website at www.laserinstitute.org/nominations/2009 for complete details and nomination forms. You may submit your nominations online or send your suggestions to the LIA office via fax (407-380-5588) by May 1, 2009.

OFFICERS/BOARD

All nominees on the ballot are required to be current members of the LIA. Some responsibilities include attendance at board meetings, support of LIA's courses, conferences, and publications, and encouragement of LIA membership.

FELLOW NOMINATIONS

The highest level of membership in the LIA is the grade of Fellow. The award recognizes members who have attained unusual professional distinction in the mission areas of laser science and technology, laser applications and/or laser safety, and have provided outstanding service to their field and LIA. Nomination packages must be completed and submitted to LIA by May 1, 2009 to allow review by the LIA Fellow Candidate Selection Group and the Nominations Committee.



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