Special Conference Section Inside

LIA TODAY

The Official Newsletter of the Laser Institute of America
The professional society dedicated to fostering lasers, laser applications, and laser safety worldwide.

Volume 14, Number 6 November/December 2006

In The News...

Joint Quantum Institute

The National Institute of Standards and Technology (NIST), the University of Maryland (UM) and the National Security Agency (NSA) have announced the creation of a joint research institute designed to advance quantum physics research and to exploit this knowledge to transform quantum technology from an exciting promise to practical reality.

The institute will be located on the University of Maryland campus in College Park. It will have an annual budget of approximately $6 million and a staff of about 20 scientists, half from the university and half from NIST. The staff will include experts in atomic physics, condensed matter and quantum information, including William D. Phillips, the 1997 Nobel laureate in physics, who is both a NIST Fellow and a Distinguished University Professor of Physics at Maryland.

The JQI's three primary scientific disciplines are:

(Cont. on pg.11, see **In The News...**)

Practical Part Repair Using Metal Deposition with Lasers

by Wayne Penn & the Alabama Laser Team

For over 40 years lasers have advanced in design and applications. Initially only scientists were excited about the possibilities for lasers. Soon, the applications that followed the laser were destined to birth new industries that would have a major impact on the manufacturing economy. As the laser grew in power, the beam quality produced a high energy density enabling applications for drilling, cutting, and welding. New industrial markets were created and others transformed by the new tool made of light.

Today, metal deposition with lasers is maturing into practical applications for the economic repair of industrial parts. Here we will cover the basic components of a laser metal deposition system as well as the application conditions and example results.

The Laser Energy Source

The basic components of a laser metal deposition system are comprised of the following: the laser, beam delivery, filler material, and mechanical motion system.

The laser is the energy source for the application, focusing to an energy density at the material that is high enough to produce a molten pool and melt the filler material. This results in an increase in the mass of the part that can be used to fill a defect or shape a new volume onto the part.

Lasers that can be used for metal deposition

(Cont. on pg. 6, see **Deposition**)

OP-TEC
National Center for Optics & Photonics Education

by Dr. Fred P. Seeber

OP-TEC, the National Center for Optics and Photonics, is a recently funded National Science Foundation Advanced Technological Education (ATE) Center with the mission of promoting photonics education by assisting colleges around the country in developing and implementing educational programs that support expansion of this critical technology. By providing information materials and networking opportunities, colleges and universities around the country can take steps in implementing photonics programs that give their students the opportunity to work in this rapidly expanding, high-demand, high-paying field that is expected to grow more than 1,800 per year on average through 2009.

OP-TEC will develop materials in photonics and create career pathways that will begin at the high school level and extend into post-secondary degrees.

I, an LIA fellow and former board member, am a co-PI (principal investigator) of OP-TEC and will coordinate the partner colleges and

(Cont. on pg. 8 see **OP-TEC**)

13501 Ingenuity Drive, Suite 128; Orlando, FL 32826 Phone: 407.380.1553 Fax: 407.380.5588
http://www.laserinstitute.org

IN THIS ISSUE...

Features

Practical Part Repair Using Metal Deposition with Lasers ..1
OP-TEC, National Center for Optics & Photonics Education 1
Akira Matsunawa.....10

Special Conference Section after page 8!

Departments

In The News 1
Calendar of Events.....2
Executive Director's Msg.....5
Test Yourself 9
JLA Update.....11
Welcome New Members.....12
Chapter Corner.....13
Members in Motion 14
ASC Z136 Update 14
LIA Announces 15

Advertisers

ALAW 9
Academy of Laser Dentistry ..14
BLS 4
Coherent, Inc. 8
Directed Light 15
ILSC 16
Kentek 3a
LIA Laser Safety Podcasts 5
Laser Focus World.....12
Lee Laser 8a
Photonics Spectra 7
Photonics West 13
Precitec & American Laser Enterprises 11
Wilson Industries 3

Contact LIA for information on any of the above advertisers.

LIA TODAY

The Official Newsletter of the Laser Institute of America

LIA TODAY is published bimonthly and strives to educate and inform laser professionals on 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 their 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.

If you are interested in affordable advertising space in this newsletter or a subscription, please contact Jim Naugle at 407.380.1553 or 1.800.34.LASER.

Laser Institute of America (LIA) is the professional society dedicated to fostering lasers, laser applications and laser safety worldwide. LIA is the secretariat and publisher of the ANSI Z136 series of laser safety standards, and is a leading provider of laser safety education.

LIA offers educational programs, conferences and symposia on the applications of lasers and electro-optics. LIA's annual International Congress on Applications of Lasers & Electro-Optics (ICALEO®) features the world's foremost meeting on laser materials processing. The biennial International Laser Safety Conference (ILSC®) covers all aspects of laser safety practice and hazard control.

If you would like more information about the LIA, call 407.380.1553, 1.800.34.LASER or visit our home on the Web: **www.laserinstitute.org**.

LIA's Calendar of Events

For more information contact LIA at 1.800.34.LASER or visit www.laserinstitute.org

Laser Safety Officer Training
May 7-9, 2007 • Indianapolis, IN
July 16-18, 2007 • Raleigh, NC
Aug. 6-8, 2007 • Albuquerque, NM
Oct. 29-31, 2007 • Orlando, FL
Dec. 3-5, 2007 • Miami, FL

Laser Safety Officer with Hazard Analysis
Feb. 5-9, 2007 • Orlando, FL
Mar. 26-30, 2007 • San Diego, CA
June 4-8, 2007 • Baltimore, MD
Sept. 17-21, 2007 • San Francisco, CA

ILSC® 2007
Mar. 19-22 • San Francisco, CA

Medical Laser Safety Officer Training
Jan. 26-27, 2007 • San Diego, CA
Feb. 23-24, 2007 • Orlando, FL
May 18-19, 2007 • Atlanta, GA
Sept. 21-22, 2007 • San Francisco, CA
Nov. 9-10, 2007 • Raleigh, NC

Advanced Concepts in Laser Safety
Sept. 24-26 • Rockville, MD

ALAW
Apr. 17-19, 2007 • Plymouth, MI

ICALEO® 2007
Oct. 29-Nov. 1 • Orlando, FL

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

Become A Certified LSO Today!

Why Become Certified?

As the use of lasers grows both in popularity and applications, there will be a growing demand for trained laser safety professionals. BLS certification will enhance the credibility of a designated Laser Safety Officer, and demonstrate that individuals serving in the field of laser safety have agreed to adhere to high standards of safety and professional practice.

Benefits of Becoming Certified

- Upgrade your laser safety knowledge
- Gain a competitive edge
- Stay current on changes in the industry
- Achieve recognition
- Become part of a unique worldwide network of laser safety professionals
- Connect with other CLSOs and CMLSOs to share solutions

Examination Information

It is easier now more than ever to take the exam. All Certification exams are offered via Computer Based Testing. We have over 320 exam locations in the US and Canada. The bottom line is you can take the exam when and where ***you*** want at ***your*** convenience.

BLS Background

The Board of Laser Safety (BLS) was incorporated in September 2002 as a nonprofit organization affiliated with the Laser Institute of America (LIA), a California nonprofit corporation. The mission of the BLS is to provide a means for improvement in the practice of laser safety by providing opportunities for the education, assessment, and recognition of laser safety professionals.

Take the Next Step!

What are you waiting for – call the BLS today for an application at (800) 345-2737 or visit our website to download one at ***www.lasersafety.org***.

BLS®
Board of Laser Safety™

NEW!

LIA's Laser Safety Administration Package

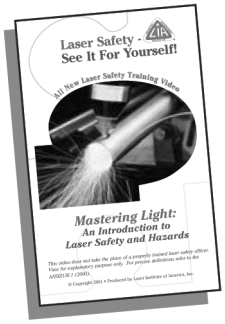
(Pub. #210)
Price: $249, LIA Members: $229

This interactive CD is intended for anybody responsible for setting up and maintaining a laser safety program in an industrial or research facility. It includes the tools necessary for setting up a laser safety program, especially the new LSO. Whether you are starting from scratch or want to be sure you have all the components for a solid program, this product is for you.

Included in customizable electronic format to suit your specific needs are:

- Sample Institutional Laser Safety Policy
- Sample Institutional Laser Safety Procedure
- Information for an Operational Standard Operating Procedure (SOP)
- Facility Self Auditing Questions
- Laser Safety Overview Training Module
- And much more!

You can preview this product on LIA's website at *www.laserinstitute.org/media.*



Mastering Light: An Introduction to Laser Safety and Hazards©

ISBN# 0-912035-70-6
(Pub. #303) VHS
(Pub. #303D) DVD version
Price: $370, LIA Members: $320

"Mastering Light: An Introduction to Laser Safety and Hazards" is the first video available to reflect the 2000 revision of the ANSI Z136.1 *Safe Use of Lasers* standard. Developed for the laser operator, laser safety officer, researcher or student, this video provides an effective and cost efficient training resource of safe practices while the laser or laser system is in use. Furthermore, it fulfills the ANSI Z136.1 and OSHA training requirements for employees working with or around Class 3b or 4 laser or laser system. Specifically, this video covers:

❖ Beam Hazards ❖ Bioeffects ❖ Non-beam Hazards
❖ Control Measures ❖ Classification Scheme

This video is also an excellent training tool for the LSO in industrial or research environments who has the responsibility to train new employees and keep the existing ones updated and refreshed on current laser safety issues and practices. A sample of this video can be viewed at *www.laserinstitute.org/media.* Site license available!

Executive Director's Message

LIA Executive Director Peter Baker and Akira Matsunawa at the 2002 Schawlow Award presentation.

We just returned from ICALEO® 2006 in Scottsdale, our 25th anniversary ICALEO. By all measures it was our biggest and best ever, and I want to thank everyone who attended and everyone who contributed to this fine affair.

Since there is not space to mention everyone by name, let me single out General Chair Andreas Ostendorf, Laser Materials Processing Chair Paul Hilton and Laser Microprocessing Chair Yongfeng Lu together with all their session chairs for assembling an excellent high-quality program.

It was also a great pleasure to welcome David Whitehouse who chaired the original ICALEO in Boston in 1982. David was very complimentary about the quality of the program and the professionalism of Director of Conferences Beth Cohen and the LIA staff.

My only regret was the absence of honorary chair, 23-year ICALEO attendee and 2002 Schawlow Award winner Professor Akira Matsunawa who passed away on Sept. 20. We will all miss his technical and organizational contributions, but most of all his smiling face.

Peter Baker

pbaker@laserinstitute.org

Deposition , cont. from pg. 1

include:

1. Carbon dioxide (CO_2) gas lasers – The carbon dioxide gas laser is the original industrial workhorse. The CO_2 laser generates efficient beam energy at industrial power levels with a broad base of applications in the metal cutting market. The medium infrared wavelengths (10.6 micron region) from CO_2 lasers are safer to the human eye than visible or near infrared lasers, thus allowing simpler enclosures for safer operation on the job shop floor. The CO_2 laser beam is delivered with free space hard optics.

2. Nd:YAG lasers – The older types of Nd:YAG lasers (the second industrial work horse) are pumped with flash lamps. Many of the new Nd:YAG lasers are pumped with laser diodes. The Nd:YAG laser produces energy in near infrared (IR) wavelengths. The Nd:YAG laser can be delivered by free space hard optics or fiber into a Class I work enclosure for eye safety.

3. Fiber lasers – The fiber laser in the past few years has grown to high industrial powers with efficiencies that result in small chiller requirements. The laser beam's wavelength is in the near IR. The fiber laser is pumped by laser diodes. A passive fiber with fiber optic connectors is then often used to carry the beam to a Class I work enclosure for eye safety.

4. Diode lasers – The diode laser uses direct conversion from electricity to produce a laser beam in the near IR typically right outside the red end of the spectrum. The direct diode laser has high efficiency. The beam may be delivered by free space hard optics or by fiber. The diode laser should operate in a Class I enclosure for eye safety.

Beam Delivery

The beam delivery system provides a path for the laser photons to move from the laser to the work piece. Fiber beam delivery offers mechanical flexibility, while free space hard optic beam delivery requires high mechanical stiffness and stability for reliable operation. Both systems require sealing and purging to maintain absolute cleanness in the industrial environment.

Table 1 shows the different lasers and summarizes some of the basic properties of each.

Filler Material

The filler material adds mass to the part. Either powder or wire can be used. Wire is a cleaner process, not leaving behind the residue produced when using powder.

Wire requires precise alignment with the melt pool. Also the wire must be available in the alloy desired.

Powder is fed in with a powder delivery system through a nozzle that is located about a centimeter from the molten pool. Careful alignment is necessary for proper deposition control with a balance between the geometry of the deposit and the time the powder spends in the beam before hitting the molten pool. If too much powder is used and or the powder spends too much time in the beam then the beam spot on the base material is distorted with a reduction in energy density. If the energy density is too low, then the molten pool will become unstable or nonexistent. Parameters to balance include:

- Laser power
- Deposition rate
- Deposition alignment and intersection with the molten pool
- Deposition mass delivery rate
- Spot size
- Energy density
- Speed of deposit (motion system)

Photo 1 – Example of a laser metal deposition system.

Mechanical Motion System

The motion system for metal deposition includes accommodation of the part fixtures and management of the powder waste if the system uses powder.

The motion system and beam delivery are housed in a Class I enclosure such as the system shown in Photo 1.

Application Conditions

Before repairing a part using metal deposition, one must first make sure that the part is clean – free of oxides and contamination. Many parts to be repaired have been used in the field and often are exposed to contaminating conditions. Pre-machining a surface may be necessary to expose clean metal for proper metallurgical bonding with the deposited material.

Once the surface is clean, you will need to determine the proper starting parameters for the metal deposition process. A basic technique is to first establish a "bead on plate" diffusion type of weld. This weld is accomplished by using the laser to create a molten pool on the base material, and then moving the pool across the surface without depositing any additional metal. A solidified track is created on the part and must then be analyzed for:

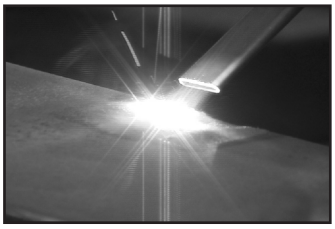
- Bead width
- Bead penetration
- Welding speed
- Stable pool solidification
- Stable wetting of the material (clean interface between the molten pool and base material)

Once the starting parameters are established then add the powder or wire and increase the laser power or slow the process speed for the additional energy needed to melt the material being deposited. The amount of power or process speed reduction needed will be a function of the delivery rate.

Four regions will be present after the deposition is

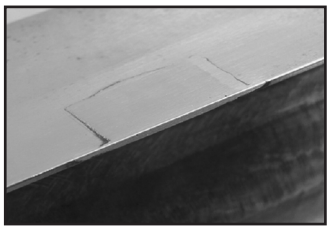
Table 1

Laser	Technology	Emission	Beam Delivery	Beam quality
Carbon Dioxide	Gas discharge	Medium IR	Free Space (FS)	High
Nd:YAG	Rod or disc	Near IR	FS or fiber	Medium to high
Fiber	Active fiber	Near IR	Fiber or FS	High
Direct Diode	PN junction	Very Near IR	FS or fiber	Low



Laser metal deposition process running.

Repaired part ready for grinding.



Repaired part after grinding.

made. The first region is the deposit with a small grain structure that results from the laser metal deposition. The second region is a base material dilution zone with the deposited material. The third region is a heat-affected zone (HAZ) and the final region is the original base material. Each region has its on specific metallurgical properties depending on the materials used and the deposition parameters.

High hardness (HRC60 plus) can be achieved in the deposition with a narrow dilution zone. The heat-affected zone can transform the base material in this region.

Example Results

The repair of commercial parts can be accomplished at high speeds with laser metal deposition technology. For example, a laser deposited repair made on a sheet metal folding die used the following:

- Direct diode laser with maximum power of 4kW running at 2250 watts
- Beam shape 1 millimeter wide by 12 millimeters length
- Robotic motion system for part manipulation process speed 5 millimeters per second
- Powder feeder distributing alloy powder at 17 grams per minute
- Argon shield gas
- Four layers deposited - total process time approximately two minutes

The laser metal deposition system can deposit a strip of metal approximately 12 millimeters wide and .5 millimeters thick at a speed on the order of five millimeters in length per second. The photos show the metal folding machine die repaired with the conditions given above.

Conclusion

Laser metal deposition technology has exciting possibilities for the future. The feasibility of commercial part repair is now available. Applications for this technology will broaden as lasers become less expensive. Various hybrid technologies coupled with the laser also holds potential for future applications. ✱

Wayne Penn (256-358-9055), president of Alabama Laser Systems, (www.alabamalaser.com) Munford, AL, has over 30 years of experience with lasers.

OP-TEC , cont. from pg. 1

universities for the OP-TEC grant. Dan Hull, formally of CORD, is the PI for the project. Dr. Art Guenther, a past LIA president and Schawlow award recipient, will coordinate professional society activities for OP-TEC.

Fred Seeber will help coordinate OP-TEC members.

OP-TEC Goals

OP-TEC will serve primarily two types of one- and two-year post-secondary programs: 1) those devoted to lasers, optics, and photonics technology; and 2) those devoted to technologies that are enabled by optics and photonics. OP-TEC will provide support through curriculum, instructional materials, assessment, faculty development, recruiting, and support for institutional reform. OP-TEC will serve as a national clearinghouse for teaching materials; encourage more schools and colleges to offer programs, courses, and career information; and help high school teachers and community and technical college faculty develop programs and labs to teach technical content.

The project has four main goals: 1) serve as a national resource center for optics and photonics education and training; 2) create, assemble, align, and distribute coordinated curriculum materials designed to support optics, laser, and photonics education in high schools, two-year colleges, and retraining of adult workers; 3) support established and new photonics education programs in high schools, community and technical colleges, universities, and professional societies; and 4) provide education and training for administrators, counselors, high school teachers, and faculty to infuse photonics into programs in photonics-enabled technologies; and teach optics, photonics, and lasers using curriculum materials distributed by OP-TEC.

Future Outlook

The center's planners project that by the end of year four, the number of schools using OP-TEC's materials and services will be 150+ colleges and 400+ high schools. The net result will be a significant increase in the pool of qualified technicians in the many technologies that are enabled by photonics.

Besides myself, Dan Hull and Arthur Guenther, other principals involved in OP-TEC are: Dr. Larry Grulick, co-PI (Texas State Technical College), Dr. Chyrsanthos Panayiotou, co-PI (Indian River Community College), Ms. Dominique Foley, co-PI (Sandia National Laboratory), Dr. Darrell Hull, evaluator (Baylor University) and Dr. John Souders (CORD). ✱

Dr. Fred P. Seeber is a co-principal investigator of OP-TEC.

OP-TEC Services

These following services can and will be provided by OP-TEC:

1. Information about Photonics Technology and Technician Careers
- Provide an overview of optics and photonics technology
- Identify technical areas where photonics is an enabling technology
- Maintain updated needs projections for photonics technicians
- Post job opportunities for photonics technicians
- Maintain a website for information exchange within the photonics community

2. Technical Assistance in Program Feasibility and Planning
- Identify local employers that are involved in the photonics industry
- Determine specific areas of concentration required by local photonics employers
- Assist secondary and post-secondary institutions infusing photonics into existing technical curricula

3. Technical Assistance in Curriculum Design and Development
- Participate in organizational meetings of photonics advisory committee
- Adapt the Photonics Skill Standards to meet local/regional needs
- Design and develop career pathways in photonics to meet local industry requirements
- Assist educational institutions in selecting the most effective teaching models

4. Technical Assistance in Designing Laboratories
- Provide guidance in configuring laboratories
- Recommend equipment and suppliers
- Provide cost estimates
- Assist in selecting laboratory experiments

5. Training
- Provide on-line training for teaching postsecondary optics and photonics principles
- Provide on-line training to understand and implement photonics curricula
- Provide professional development opportunities for high school teachers to enhance their skills in presenting photonics topics

Test Yourself

Do you know the basics?

1. **Solids, liquids, and gases are examples of which one of the following?**
   - **A.** An excitation system.
   - **B.** A lasing medium.
   - **C.** An optical resonator.
   - **D.** A laser property.

2. **Which class of laser would be considered safe if not viewed longer than the eye's aversion response?**
   - **A.** Class II
   - **B.** Class IIIa
   - **C.** Class IIIb
   - **D.** Class IV

3. **Which type of reflection is caused when a beam strikes a mirror-like surface?**
   - **A.** Direct
   - **B.** Intrabeam
   - **C.** Diffuse
   - **D.** Specular

4. **A sensor card does which of the following?**
   - **A.** Converges the laser beam.
   - **B.** Re-directs the laser beam.
   - **C.** Encloses the laser beam.
   - **D.** Produces a visible spot at the location of the beam.

5. **The visible portion of the electromagnetic spectrum is generally defined as which of the following wavelength ranges?**
   - **A.** 100 nm to 400 nm
   - **B.** 400 nm to 700 nm
   - **C.** 1 micron to 1.5 microns
   - **D.** 1040 nm to 10600 nm

Don't know as much as you thought you did? Don't get stressed – call the LIA! No matter what your current level of safety knowledge, we have the training and/or publications you need to pass with flying colors!

Laser Institute of America • 800.34.LASER • www.laserinstitute.org

(Answers: B, A, D, D, B)

Akira S. Matsunawa

by Jack Dyer, Contributing Editor

It is with deep regret we announce the passing of Emeritus Professor Akira S. Matsunawa, Dr. Eng., of the Welding Research Institute at Osaka University, Hyogo, Japan. The highly respected Laser Institute of America fellow and board member died Sept. 20 in Japan after a short illness.

In recognition of his many teaching and writing contributions to worldwide laser materials processing technology and his 23 years of faithful attendance at ICALEO®, Aki was made honorary ICALEO chair for 2006. Upon notification of his death, LIA Executive Director Peter Baker said, "It is a great disappointment that we are not able to honor him in person at ICALEO. We will all miss him terribly."

"I first met Akira Matsunawa at the International Processing Conference in Anaheim in 1981, where we both presented papers. In addition to his obvious technical prowess, for which he was recognized with the Arthur L. Schawlow Award in 2002, Aki was extraordinarily friendly and personable. He never failed to greet me and his numerous friends with enthusiasm and affection," said Baker.

Fellow Schawlow Honorees Comment

Past LIA President Edward Metzbower recalls visiting Matsunawa at Osaka University and also hosting him during a visit to National Research Labs in Washington.

"Professor Matsunawa was a very talented scientist who understood the basics and nuances of laser beam processing. He was extremely helpful to the many countrymen that he encouraged to present at ICALEO, often by translating questions from and to English and Japanese for greater clarity. And Akira was always efficient and tactful as chairman of Commission IV (Laser and Electron Beam) of the International Institute of Welding." – *Edward Metzbower*

In commenting on his death, David Belforte, editor of *Industrial Laser Solutions*, says, "It was through his association with the LIA that Akira gained global recognition for his work in a variety of laser materials processing developments."

Akira Matsunawa

"I met Akira in the late 1970s when he first came to the United States to continue his studies at Ohio State University. At that time, he graciously acted as an intermediary in my discussions with Prof. Y. Arata at Osaka University. Upon his return to Japan, he worked at the university in support of the Welding Research Institute, a position he continued until Arata's death.

"On his recent retirement, he planned to spend his remaining days as an advisor to those he had interfaced with and enjoying time with his lovely wife, Junko, and children Ayako and Asa. His untimely death will be felt deeply by his many admirers." – *David A. Belforte*

Joining the chorus of praise is England's Liverpool University's William Steen who notes, "Aki's contribution to the science of the processes taking place when laser radiation interacts with material was of the first rank, particularly with his work on plasmas phenomenon, flow within the keyhole, and surface tension effects.

"I first met Professor Matsunawa at the Osaka welding conference in 1980. He visited the first LIA-sponsored conference in 1981 and subsequently attended all ICALEO conferences until 2005, which he missed due to his daughter, Ayako's wedding. I do not believe any other member of the LIA has achieved this level of attendance.

"Aki and I had many things in common, similar ambitions and a similar enthusiasm for laser material processing. Aki had a deeper understanding of the subject than most and he had the ability to teach this to others. A significant part of the advanced growth in the world's laser processing capabilities is due to his ability to organize the Japanese government's investments in the technology and through his own research ability and infectious enthusiasm." – *William Steen* ✱

Dear Peter and Laser Institute Members,

Thank you very much for your beautiful flowers at the funeral for Aki. Your kind message and flowers meant so much to Aki and to our two daughters and me. The flowers were put right next to Aki's picture at ICALEO.

Once again I would like to thank you for your cooperation and friendship for Aki. He enjoyed all the ICALEO conferences, and it was always my pleasure to hear the progress and development of the conference.

The family misses Aki terribly but all the happy memories we have of him will stay in our hearts.

Sincerely,
Junko Matsunawa

In The News, cont. from pg. 1

atomic, molecular and optical physics (such as ultra-cold atomic gases, matter wave optics, quantum optics and optical lattices); condensed matter physics (such as quantum dots and superconductivity); and quantum information science (such as quantum measurement theory, quantum computation and quantum communication).

Eye Scan Shows First Sign of Alzheimer's Disease

Neuroptix, a U.S.-based company, has developed an optical technique for early diagnosis of Alzheimer's disease (AD). Instead of having to wait until a patient shows signs of mental degeneration, Neuroptix's optical technique can indicate the likely onset of the disease many years earlier. The Neuroptix system, known as the QEL 2400, measures the presence of telltale amyloids in the lens of the eye with a combination of dye treatment and scanning by an infrared laser. Neuroptix's founder, Lee Goldstein, made a breakthrough discovery – that beta amyloid proteins, which create plaque in the brain of patients suffering from AD, can also be identified in the lens of the eye, reported the Oct. 9 issue of *Optics.org*.

Eye drops are applied that contain a fluorescent ligand (dye), which is temporarily absorbed by the lens and binds to amyloid proteins. A low-power class I laser scans the lens, exciting the fluorescent dye and scattering off the protein aggregates. The fluorescent dye provides the biochemical specificity, identifying the type of protein. Using a technique called quasi-elastic light scattering, Neuroptix is able to quantify the size of the protein aggregates and makes a judgment on the likelihood of the patient becoming an AD sufferer based on the light measurements and post-processing that data using their software.

This is a major medical breakthrough. The opportunity to catch the disease prior to cognitive loss, and to enable early treatment, is enormously significant. This article originally appeared in the October 2006 issue of *Optics & Laser Europe* magazine. ✱

Journal of Laser Applications® Update

The *Journal of Laser Applications®* offers the latest refereed papers by leading researchers in the laser community. The November 2006 issue includes papers from materials processing, biomedical and safety. Look for the online version at www.laserinstitute.org/publications/jla/. To view the journal online, please make sure your membership is current. Starting with the February 2007 issue, online figures will be in color. 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 non-members of LIA, call the American Institute of Physics at 1.800. 344.6902 for subscription information.

Sign up at http://scitation.aip. org/jla/alert.jsp to receive your JLA table of content e-mail alerts.

Welcome New LIA Members

Corporate Members

- Buffalo Filter, Amherst, NY
- Celibre Laser Skin Care, Torrance, CA
- General Atomics, Photonics Division, San Diego, CA
- JPSA Laser, Hollis, NH
- Laserplus Oy, Hameenlinna, Finland
- Teem Photonics USA, Inc., Wellesley, MA
- Universidade de Vigo,Vigo, Spain

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

Individual Members

Jason Schellin, Chandler, AZ
Robert B. Acuna, Phoenix, AZ
Dennis Lee Bloxham, Phoenix, AZ
Scott Easter, Phoenix, AZ
Frank Paoletti, Phoenix, AZ
Rachel Halperin, Tempe, AZ
Joseph Patricko, Jr., Duarte, CA
Rob Greenlaw, Huntington Beach, CA
Keith Endow, Miltitas, CA
Daniel Beom Soo Soh, Sunnyvale, CA
Renu Tripathi, Palomar Mountain, CA
Betty Minor, Denver, CO
Jochen Deile, Farmington, CT
Holger Schlueter, Farmington, CT
William Fendt, Newark, DE
Roberta Clark, Jacksonville, FL
John Mills, Fort Walton Beach, FL
Steven Wilson, Jacksonville, FL
Keng Leong, Homer Glen, IL
Kerry Miller, Shelbyville, IN
Alina Echavarria, Billerica, MA
Enrique Testa, Boston, MA
Russell Tetreault, Boston, MA
Guru Prasad Dinda, Ph.D., Ann Arbor, MI
Mikhail I. Vasilyev, Ann Arbor, MI
Xiuli He, Ann Arbor, MI
Greggory P. Orlandi, South Lyon, MI
Erin Flitt, Charlotte, NC
Krista R. Theriot, Hendersonville, NC
Zhaoxu Tian, Nashua, NH
Wenwu Zhang, Schenectady, NY
William J. Koach, Jr., Cuyahoga Hts., OH
Timothy Niemeier, East Texas, PA
Mara Lynn, Steinberg, Allentown, PA
Thomas Ducharme, Cumberland, RI
Bruce Ribble, Liberty, SC
Christopher Devlin, San Antonio, TX
David E. Kee, Jr., San Antonio, TX
Alaina Zieglar, Lynchburg, VA
Peter A. Jenkins, Waynesboro, VA
Greg Dahlke, Schofield, WI
Lorne Scott, Tilley, Burnaby, BC, Canada
Patrick Gougeon, Chicoutimi, QC, Canada
William Yonev, Jr., Hamilton, ON, Canada
James L. Booth, Vancouver, BC, Canada
Volker Brandl, Pfungstadt, Germany
Frank Vollertsen, Bremen, Germany
Tsuyoshi Tokunaga, Narashino City, Japan
Susumu Tsukamoto, Tsukuba, Ibaraki, Japan
Henry Peng, Shanghai, China
Augusto M. Deus, Lisbon, Portugal
Insu Lee, Seoul, South Korea
Heekyung Kim, Seoul, South Korea
Kwang-Ryul Kim, Kyunggido, South Korea
Bernt Von Bromsen, MD, Molndal, Sweden

Chapter Corner

LIA encourages all LIA members in the surrounding areas of these chapters to join the chapter and support its efforts to promote the laser industry on a regional level. For more information or to volunteer to help, visit www.laserinstitute.org/membership/chapters.

Northeast Chapter

The next meeting of the Northeast Chapter will be held Dec. 19, 2006 at the Colonial Club in Webster, Mass., with the topic "Intelligent Laser Welding, Beam Delivery and Sensor Considerations." Also on the agenda is an open house of IPG Phtonics where attendees can tour the manufacturing facility and view fiber lasers in action. For more information, visit www.laserinstitute.org/membership/chapters/new_england/.

Great Lakes Chapter

The most recent meeting of the Great Lakes Chapter was held Oct. 17 at the University of Michigan. It was a joint meeting with the regional chapter of the Optical Society of America. The meeting opened with elections for the 2007 chapter officers. Eric Stiles of the Fraunhofer Institute, Plymouth, Mich., was unanimously elected as the chapter chairperson. Mon Myaing of Clark MXR, Dexter, Mich., was elected as secretary, and Mike Klos and Michelle Stock will serve as chapter advisors.

The main part of the evening was a poster session for college level students. The intention of the poster session was to have students set up a small display outlining his or her laser-related project. Each display was then judged by six individuals on the basis of clear description of the project, how much it was laser related, the data displayed, how much the student's interaction forwarded the project and if the result would further the laser industry. Many different topics were covered.

The first meeting for the 2007 year is expected to be held Jan. 16. The meeting is planned to be a showcase of local laser-related companies and networking opportunities. No firm location is set yet. For more information, please visit www.laserinstitute.org/ membership/ chapters/great_lakes/.

Northern CA Chapter

The Northern CA Chapter includes the state of California, but is not limited to just that state. The goal of the chapter is to create a forum for networking with laser professionals in Northern California that include laser end-users, manufacturers of lasers and related products, safety officers, company presidents and researchers. Bimonthly meetings will be held throughout the area with a guest speaker or company tour as part of each one. For more chapter-specific information, visit www.laserinstitute.org /membership/Chapters/ West/.

Members In Motion

Aculight Named a Top 50 High-Tech Firm

Aculight Corporation, Bothell, Wash., a developer of innovative laser technologies, has been named to *Washington CEO* magazine's "Top 50 High Tech Firms in Washington" list for 2006. The list is a ranking of the 50 largest high-tech companies in Washington State. Aculight ranked number 34, up from 60 in 2005.

"Aculight is steadily growing from a research company into a product development and manufacturing company," said Aculight President and CEO Don Rich. "We're investing in the talent that's necessary to take us to the next level of product development and production."

European Industry Support

Servo-Robot and the ISF-Welding and Joining Institute RWTH, Aachen University, Germany, have come to an agreement to promote the applications of advanced vision and information technology in the joining automation field, and to provide technical services to European industries in the field of automated joining technologies. The institute will provide facilities for testing and demonstrations of advanced laser and arc welding processes. This cooperation will also include R&D programs and personnel training to assist the industry in the applications of Servo-Robot and IFS techniques. ✱

Kentek Announcement

Kentek Corporation is no longer an authorized dealer or distributor of GPT Glendale, Inc. and no longer sells any GPT Glendale Inc. products.

ASC Z136 Update

Notification of Potential New Z136 Safety Standards

At the last annual meeting of ASC Z136, a proposal was made to develop a series of vertical applications standards to deal with user controls within the context of the application. The new vertical standards would permit the simplification of future editions of the ANSI Z136.1 Safe Use of Lasers standard by alleviating the need to contain the specialty information now included in the document.

In accordance with ASC Z136 procedures, establishment of standards subcommittees charged to develop each new standard was balloted and approved by the consensus body. The newly formed subcommittees are SSC-8, Safe Use of Lasers in Research, Development and Testing; SSC-9, Safe Use of Lasers in Manufacturing Environments; and SSC-10, Safe Use of Lasers in Entertainment, Displays and Exhibitions.

For more information on the subcommittees, or to apply for membership, visit www.z136.org or contact Barbara Sams at the LIA, 407-380-1553 or bsams@laserinstitute.org. ··· Talk one-on-one with subcommittee chairs! Information and applications for membership will be available at the ASC Z136 vendor booth at the International Laser Safety Conference, Mar. 20, 2007. See you there!

LIA Announces

Save the Date!

Lasers — Ultimate Flexibility will be the focus of the 2007 ALAW conference to be held April 17-19, 2007 at The Inn at St. John's in Plymouth, Mich. This three-day premier industry event introduces state-of-the-art processes in laser technology in manufacturing and automotive environments. The 2007 conference has been expanded and improved by adding another day aimed at educating end-users on laser applications and the benefits of using laser technology.

Day one of the conference is entitled "Fabricators Day – Making Money with Lasers" and will focus on giving managers and owners of manufacturing facilities and job shops a fundamental understanding of laser technology, application realities, and solutions to practical problems. Days two and three, the "Automotive Laser Applications Workshop," will feature senior level executives and engineers from the global automotive industry delivering presentations 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. For more information contact Rich Greene at 407-380-1553, e-mail rgreene@alawlaser.org, or visit www.alawlaser.org.

Save the Date Two!

The 26th International Congress on Applications of Lasers & Electro-Optics (ICALEO®) will be held Oct. 29-Nov. 1, 2007 in Orlando, Fla. Sponsor and vendor program opportunities are now available! Please visit www.icaleo.org or contact Director of Conferences Beth Cohen at bcohen@laserinstitute.org for more information.

LIA at Fabtech

FABTECH® 2006, co-sponsored by the Society of Manufacturing Engineers (SME) and the Fabricators & Manufacturers Association International (FMA), was held Oct. 31-Nov. 2, 2006 in Chicago, Ill. Fabtech is North America's largest annual metal and fabricating event with over 850 exhibitors with more than 2,000 products on display and a wide range of technologies and equipment in action. Attendees stopped by the LIA booth and learned about the laser safety training available from LIA, which includes the ANSI standards for safe use of lasers series, the *LIA Handbook for Laser Materials Processing*, and laser safety training. For more information visit www.fma fabtech.com.

Laser Dentistry Conference

The Academy of Laser Dentistry will be hosting Source 2007: Lasers in Dentistry, the academy's annual conference and exhibition, on Mar. 28-31 in Nashville, Tennessee. This is one of the most comprehensive dental conferences in the world that concentrates on scientific research and clinical uses of lasers in dentistry. For more information visit www.laserdentistry.org. ✱

Happy Holidays from the LIA!

SAVE THE DATE!

MARCH 19 - 22, 2007 • SAN FRANCISCO AIRPORT MARRIOTT • SAN FRANCISCO, CA USA

ILSC® 2007

INTERNATIONAL LASER SAFETY CONFERENCE • "THE WORLD'S LEADING CONFERENCE ON LASER SAFETY"

New for 2007 –

Laser Safety Practical Applications Seminar March 19 - 20

Chairs: Eddie Ciprazo, CLSO, UC Berkeley, Berkeley, CA USA

Robert Sarason, CLSO, Univ. of California at Davis, Davis, CA USA

A 2-day seminar for the Laser Safety Officer. Participate in practical interactive workshops, panel discussions, and hot topics addressing the more common safety issues and concerns of the Laser Safety Officer and Medical Laser Safety Officer. Learn and network with your peers! Go to www.laserinstitute.org/conferences/ilsc for more details!

General Conference Chair:
Benjamin Rockwell, AFRL / HEDO
Brooks City-Base, Texas USA

Featured in ILSC

- *Safety Standards - Worldwide*
- *Lasers - Operational Policies & Practices*
- *Bioeffects*
- *Laser Light Shows & Displays*
- *Non-Beam Hazards*
- *Hazard & Risk Analysis*
- *Measurements & Global Acceptance*
- *Protective Systems & Devices*
- *Training Programs*
- *Laser Safety in Health Care Facilities*
- *Lasers in Telecommunications*
- *Laser Safety in R & D Labs*

LIA TODAY Newsletter
Laser Institute of America
13501 Ingenuity Drive, Suite 128
Orlando, FL 32826

Nonprofit Org.
U.S. Postage
PAID
Orlando, FL
Permit #2342