On the Cover:
Central Florida Photonic Powerouse

Also in this Issue:
Entertainment Focus
– Raising Standards Through Training
LIA TODAY is published quarterly to educate and inform students and professionals of challenges and innovations in the field of photonic materials processing.

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CENTRAL FLORIDA PHOTONICS POWERHOUSE
The Laser Institute talks with Mike McKee, Associate Director of the Undergraduate Program at The University of Central Florida’s College of Optics and Photonics to discuss new collaborative initiatives with Valencia College to drive photonics education and awareness. Both institutions aim to inspire a new generation of STEM enthusiasts to explore the possibilities within the field of photonics.

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As the President of LIA’s Board of Trustees, I must first recognize the exemplary leadership of my predecessor, Dr. Henrikk Pantzar, during 2022 and 2023. Dr. Pantzar’s guidance proved instrumental in positioning LIA for a successful future. I also thank Gilbert Haas, as a volunteer leader, followed by being recently installed as LIA’s Executive Director, for his guidance of the LIA staff. Moreover, I commend Gil and the entire LIA staff for their unwavering dedication and effort in surpassing our organizational goals last year.

Welcome to the returning officers and new members of the Board of Trustees. Your collective expertise and vision are pivotal to our continued success.

The laser industry is a robust pillar of global economic growth, driving significant advancements across various sectors, including medicine, 3D printing, semiconductors, nanomaterial-based manufacturing, quantum computing, artificial intelligence, and energy. As a single example, consider how indispensable lasers have become for manufacturing processes such as microvia drilling for interconnects in microelectronic chip carriers. Further, legislative support, such as the CHIPS Act in the USA and similar initiatives worldwide, promise to foster new opportunities and reinforce the laser industry’s global impact.

Looking ahead, we are excited to re-introduce LIA’s Laser Additive Manufacturing Workshop (LAM) for its 15th iteration in Dayton, OH, from July 15-17, 2024. Registration is now open, and I encourage you to join us. Preparations are also well underway for the 43rd annual ICALEO in Hollywood, CA, from November 4-7, 2024. Great strides are being taken to make this year’s ICALEO a landmark event. Lastly, stay tuned for some exciting news regarding the International Laser Safety Conference (ILSC), which will take place in March of 2025. We look forward to sharing more details with you soon.

In summary, while the future is yet to be written, I am optimistic about the potential applications, opportunities, and global impact that our community will achieve. I encourage you to join the conversation and collaborate with us at LIA’s upcoming events. We must ‘invent the future,’ not wait for it. Embracing laser processing as the enabling technology, rather than merely a process improvement, is essential for propelling the growth of our industry.

United in purpose,

A. Kar

As we move further into 2024, the energy, anticipation, and commitment from our staff, volunteers, and membership regarding growth within our industry and the laser community have kept LIA very busy. The dedication and hard work of the LIA staff has been instrumental in shaping our strategic direction for the upcoming year.

I’ve had the privilege of collaborating with the staff to identify and develop a strategic plan focusing on the profit centers within our organization. Our budget for the 2025 fiscal year, which began on April 1, 2024, has been approved by the Board of Trustees. This budget incorporates those strategic initiatives, setting us on a promising path for the future.

In our ongoing efforts to enhance collaboration and accommodate our growing staff, we are currently undergoing office renovations. These improvements will provide an even more conducive environment for innovation and teamwork. Regarding LIA growth, I’m excited to announce that we’ve welcomed Brian Coleman as our new business development director. Brian’s expertise and enthusiasm are already proving to be invaluable assets to our team.

Thank you for your continued support and involvement with The Laser Institute. Together, we are shaping a brighter future for the laser industry.

Sincerely,

Gilbert Haas
Executive Director

Special Thanks to our Editorial Committee
Martin Barraclough - ER Productions
Dr. Youngfeng Lu - University of Nebraska - Lincoln
Dr. David Slaney
Dr. Ron Shaefter - HH Photonics
LIA Staff Editors
Jana Langhans; John McCormack
A Look Ahead at Upcoming Laser Safety Training!

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For a complete list of courses, both online and in-person, please visit lia.org/training.

Course Highlight

**MEDICAL LASER SAFETY OFFICER**

**MAY 18-19, 2024 - EDEN PRAIRIE, MN**

Are you an RN, OR supervisor, surgical tech or training coordinator who has been assigned the critical responsibility of LSO in a medical facility? Designed to meet the special needs of medical professionals, LIA’s Medical Laser Safety Course will provide the training you need to build and maintain a successful laser safety program.

As an LSO at a medical facility, you have a unique set of responsibilities. Not only is laser safety a top priority to protect your staff, but it is critical to protecting your patients. Our MLSO training program addresses the specific laser safety protocols as they relate to medical and healthcare environments. This course meets all LSO training requirements as outlined by the ANSI Z136.3 Safe Use of Lasers in Health Care standard, OSHA, and The Joint Commission.

LIA’s Newest Corporate Members!

**NEW LIA MEMBERS**

- HSG KK
- RMA (Business Unit of AIC S.A.)
- Stack AV
- University of Massachusetts (Boston)

To find out more about becoming a corporate member, email membership@lia.org or visit lia.org/membership/corporate.

Already an LIA member? Ask about joining our Facebook group!
A Look Ahead at Upcoming Laser Industry Conferences!

1. Photonics West - Jan 30-Feb 1, 2024 (San Francisco, CA, USA)
2. AORN - Mar 9-12, 2024 (Nashville, TN, USA)
3. AKL - Apr 17-19, 2024 (Aachen, Germany)
4. DOE Workshop - Apr 30 - May 2, 2024 (Austin, TX, USA)
5. AORN - May 7-9, 2024 (Mexico City, Mexico)
6. RAPID + TCT - June 25-27, 2024 (Chicago, IL, USA)
7. LAM - July 15-17, 2024 (Dayton, OH USA)
8. ALAW - June 25-27, 2024 (Novi, MI, USA)
9. IMTS - Sept 9-14, 2024 (Chicago, IL, USA)
   - ILC - Sept 11, 2024 (Chicago, IL USA)
10. LANE - Sept 15-19, 2024 (Förth, Germany)
11. FABTECH - Oct 15-17, 2024 (Chicago, IL, USA)
12. ICALEO, Nov 4-7, 2024 (Hollywood, CA, USA)

A Look Ahead at LIA’s Industry Conferences!

- **LAM Updates**
  - **LAM, July 15-17, 2024 - Dayton, Ohio**
  - **The 2024 Advance Program** has been released! Take a peek at the program to see what exciting presentations you can expect at this year’s event.
  - **Exciting News** - Early Bird Registration has been extended through May 17th! Don’t miss your chance to save on registration and get a special group rate on the event hotel. Find all the information at www.lam.ngo/attend.

- **ILSC Updates**
  - **September 2-5, 2025 - Orlando, Florida**
  - **ILSC Updates**
    - **SAVE THE DATE**: We are excited to announce our next ILSC conference will be in Orlando, Florida from March 2-5, 2025! More information will be coming soon, so subscribe on our website at ilsc.ngo to stay in the loop as updates become available.
When were you first introduced to photonics/electro-optics?
I was introduced to the field of optics and photonics during my junior year of undergraduate studies. That year, I took my first optics courses: geometric optics and foundations of photonics. Concurrently, I embarked on research with the Knight Vision Lab at CREOL under Dr. Kyle Renshaw’s guidance. This experience exposed me to diverse topics in the field, including imaging systems, integrated photonics, and optical fibers.

What or who inspired you to choose your line of study?
My inspiration is deeply rooted in the guidance and mentorship I received from remarkable individuals throughout my academic and professional journey. In particular, my advisors, Dr. Kyle Renshaw during my undergraduate studies, Dr. David Hagan, and Dr. Eric Van Stryland, both from my master’s studies, alongside my mentor from AFRL, Dr. Christian Keyser, have played pivotal roles in shaping my aspirations and driving my commitment to excellence. Their unwavering dedication to advancing the field has motivated me to follow in their footsteps and contribute meaningfully to the world of optics and photonics.

Describe your favorite course you have taken so far.
It is difficult to choose a favorite course given the number of great courses I have taken throughout my time at CREOL. However, my favorite course so far is Quantum Optics taught by Dr. Ayman Abouraddy. The lectures were thought-provoking and engaging, covering interesting topics such as the quantization of the electromagnetic field, entangled states of light, single and two-photon interference, and the Jaynes-Cummings model. What made this course particularly impactful was its relevance in highlighting the importance of quantum optics, such as its crucial role in advancing cut-edge research areas like quantum communication, quantum cryptography, and atomic physics.

Are you researching anything at the moment? Can you tell us about it?
Currently, my main research focus revolves around the development of laser sources through the exploration of nonlinear optics. The different kinds of fibers we have explored and worked with include solid-core silica and chalcogenide fibers, as well as hollow-core fibers such as photonic bandgap and anti-resonant fibers. Additionally, we delve into gas- and liquid-filled fiber nonlinear effects, encompassing phenomena like stimulated Raman scattering and optical parametric amplification. More recently, my research has extended to measuring refractive indices of liquids using Rayleigh interferometry and determining stimulated Raman gain coefficients from spontaneous Raman scattering.

What would you like to do in the future with your studies?
Upon completing my master’s studies at CREOL, I aim to return to AFRL to apply the knowledge and skills I gained to continue advancing the optical fiber-based devices being developed there. Concurrently, I plan to apply to Ph.D. programs, aspiring to engage in research focusing on a blend of nonlinear optics and quantum optics. Long-term, I envision a career as a research scientist at AFRL, potentially leading a research group, bringing to life ideas in the area of high-power fiber lasers, nonlinear fiber optics, and the generation and application of quantum states of light. My commitment lies in utilizing my studies for furthering the research and development of technologies that benefit our nation and the global community.

What is your area of study/major?
Area of Study/Major: Optics and Photonics

Hometown/State:
Orlando, FL

Name:
Cesar Lopez-Zelaya

OPTICS & PHOTONICS

The Laser Institute of America is the world leader in laser, optics, and photonics education. The Laser Institute’s mission is to serve the needs of individuals, industry, and the nation in the area of optics and photonics education. The institute is dedicated to advancing the field through the development of educational programs and resources that meet the needs of individuals and organizations. The Laser Institute of America is committed to providing high-quality education and training in the fields of optics and photonics, and to supporting the development of new technologies and applications that are important to the global community. The institute’s vision is to be the premier resource for laser and optics education, training, and certification, and to be a leader in promoting the use of laser and optics technologies in all sectors of industry and society. The Laser Institute of America is dedicated to the advancement of optics and photonics education and training, and to the development of new technologies and applications that are important to the global community. The institute is committed to providing high-quality education and training in the fields of optics and photonics, and to supporting the development of new technologies and applications that are important to the global community.

PHOTONICS DRIVES VIRTUALLY EVERY ASPECT OF MODERN LIFE, FROM REVOLUTIONIZING TELECOMMUNICATIONS THROUGH FIBER OPTICS TO ENHANCING MEDICAL DIAGNOSTICS AND TREATMENTS WITH LASER-BASED TECHNOLOGIES. YOU CAN FIND THE MOMENTUM BUILDING AROUND PHOTONICS STUDIES AT THE UNIVERSITY OF CENTRAL FLORIDA AND ITS PARTNER PROGRAMS. UCF IS ONE OF JUST A FEW RECOGNIZED PHOTONICS PROGRAMS IN THE UNITED STATES WHERE ACADEMIA AND RESEARCH LABS WORK TO EXPLORE THE POTENTIAL OF LIGHT-BASED TECHNOLOGIES. WE SAT DOWN WITH MIKE MCKEE, ASSOCIATE DIRECTOR OF THE UNDERGRADUATE PROGRAM AT THE UNIVERSITY OF CENTRAL FLORIDA’S COLLEGE OF OPTICS AND PHOTONICS, TO TALK ABOUT RECENT EFFORTS AND EXCITING NEW INITIATIVES THAT WILL BRING MORE STUDENTS INTO PHOTONICS.

IT’S ABOUT MAKING SURE THE STUDENT FINDS THEIR PATHWAY.
With Valencia being a two-year college, UCF gets a lot of transfer students. In fact, about a quarter of UCF graduates start their college careers at Valencia. Mike explained how UCF has modified their prerequisite requirements and Valencia now offers two of the core courses already taught at UCF – Geometric Optics and Foundations of Photonics – so students are able to check those courses off before they transfer to UCF, making the transition into the photonics program more seamless. “They have an AS STEM degree that leads to us with a bachelor’s degree and then a master’s degree, so we’ve got really an entire ecosystem,” Students are now able to earn 64 of the 128 credits over at Valencia that are needed to graduate with a Bachelor of Science in Photonics and Engineering degree, so it streamlines the process and puts them on track for the four-year degree from UCF.

What happened up until this point is that the students were just taking some general classes that were in electrical. They weren’t necessarily wasting classes, but they didn’t get to the heart of the photonics program.

These new course offerings also benefit some students who are now able to go take some elective courses at Valencia, or those who are just not thriving in the major at UCF. Mike said, “We’ve got students that don’t do well in our program, but they can go over to Valencia and do an AS degree over there and get a good job. That’s what I care about. It’s not about retaining them here at UCF, it’s about making sure the student finds their pathway.”

Having these courses and programs at Valencia also gives more students exposure to photonics. Even if they have not heard of photonics before or know much about it, they will now see it in their course roster as an option and can look further into it.
A conversation heard frequently throughout the industry is that growing the younger generation in this field is crucial. Engaging students in STEM (Science, Technology, Engineering, and Mathematics) fields and growing awareness of the opportunities in photonics is exciting but presents unique challenges. Despite the growing demand for STEM professionals, many students remain unaware of the breadth and impact of these disciplines, including photonics.

To address this, educational initiatives must focus on demystifying STEM subjects and showing their real-world relevance and diverse career pathways within photonics—from research and development to entrepreneurship—to empower students to envision themselves as contributors to technological innovation.

Mike said, “That’s the problem, I think we are not doing a good job of what they would like to learn more about and pursue.”

Another way UCF’s CREOL is working to reach prospective high school students is through a photonics summer camp for students that are interested in engineering, physics, or a related field. This year’s 2024 Laser & Photonics Summer Camp will be taking place in July and includes lectures, interactive lessons, and lab work to give students a full experience. 

In front of guidance counselors and science teachers, those that help high school students make the decision of what they would like to learn more about and pursue on their journey to college. Mike said, “I don’t care if they go to Rochester, Valencia, UCF, Arizona... we all need the help.”

By fostering a culture of curiosity, inclusivity, and accessibility, we can cultivate a new generation of STEM enthusiasts who are not only aware of photonics but excited to embark on a journey of discovery within this dynamic field. Central Florida is working hard to provide this awareness and community through collaboration between schools and programs dedicated to students. “We’ve got an entire ecosystem. I think that’s the story,” said Mike.
In an exciting leap, scientists have designed an elegant solution to successfully generate MeV (10^6 eV) temperature electrons at a mere fraction (100 times smaller) of the laser intensity previously thought necessary.

First thing to know about me as you read on, is I am an entertainment guy. I’m in my 25th year in the industry, and I’m definitely ‘institutionalised’. However, for the past 10 years, my career focus has been in safety. Through personal experience, colleague loss, and understanding of the inherently transient nature of the entertainment sector, I’ve developed a very keen sense on how to bridge the gap between technical standards, and occupational competency.

Having the benefit of working for a company like ER Productions, the biggest and the best in the display laser game, has given me an ecosystem to take on this competency problem. The solutions were simple, too. Writing a course compliant with ANSI Z136, EN60825. Making it state-registered LSO compliant for places like NY, or Western Australia. Having a mix of laser safety experts, and technical display laser experts such as our leading product designers Lawrence Wright, or MD Marc Webber who was instrumental in writing industry standard guidance on laser shows, in one class, surprisingly, was ground-breaking. The biggest improvement of all? We wrote what was ground-breaking. The biggest improvement of all? We wrote what turned out to be the only class in the world for display lasers that includes laser measurements, and control engineering. The solutions were simple, too. Writing a course compliant with ANSI Z136, EN60825. Making it state-registered LSO compliant for places like NY, or Western Australia. Having a mix of laser safety experts, and technical display laser experts such as our leading product designers Lawrence Wright, or MD Marc Webber who was instrumental in writing industry standard guidance on laser shows, in one class, surprisingly, was ground-breaking. The biggest improvement of all? We wrote what was ground-breaking. The biggest improvement of all? We wrote what turned out to be the only class in the world for display lasers that includes laser measurements, and control engineering. The solutions were simple, too. Writing a course compliant with ANSI Z136, EN60825. Making it state-registered LSO compliant for places like NY, or Western Australia. Having a mix of laser safety experts, and technical display laser experts such as our leading product designers Lawrence Wright, or MD Marc Webber who was instrumental in writing industry standard guidance on laser shows, in one class, surprisingly, was ground-breaking. The biggest improvement of all? We wrote what was ground-breaking. The biggest improvement of all? We wrote what turned out to be the only class in the world for display lasers that includes laser measurements, and control engineering. The solutions were simple, too. Writing a course compliant with ANSI Z136, EN60825.
After just a couple of years of working with these new training resources, we are seeing the difference. Not just at ER Productions who strive to be the best in all areas, but the wider industry. We will train anyone without bias, as the ongoing success, and levels of safety in the display laser sector, is of benefit to us all.

Writing this article now, is also part of those small steps of continuous improvement for the sector. I’m lucky enough to have the support from ER Productions to engage and interact with the wider laser industry. We know we are the crazy cool cousins of the laser community, but raising and maintaining standards over time is our goal. I look forward to future editions, featuring the work of LSOs across the US and advancements in our technologies.

About the Author

Martin serves as Safety Director at ER Productions. He is a leading safety specialist, and a regular contributor at industry level. He has launched a series of courses to raise industry standards and harmonise working practices around the world in the field of display lasers.

In other non-accredited learning sessions, non-laser professionals are invited to our premises to learn about the technology, methods, and control measures required for safe laser display shows.

In other non-accredited learning sessions, non-laser professionals are invited to our premises to learn about the technology, methods, and control measures required for safe laser display shows.

OSHA NEWS RELEASE

US Department of Labor
issues final rule to clarify rights to employee representation during OSHA inspections

WASHINGTON, DC – The U.S. Department of Labor today published a final rule clarifying the rights of employees to authorize a representative to accompany an Occupational Safety and Health Administration compliance officer during an inspection of their workplace.

The Occupational Safety and Health Act gives the employer and employees the right to authorize a representative to accompany OSHA officials during a workplace inspection.

For a non-employee representative to accompany the compliance officer in a workplace, they must be reasonably necessary to conduct an effective and thorough inspection.

Consistent with OSHA’s historic practice, the rule clarifies that a non-employee representative may be reasonably necessary based upon skills, knowledge or experience. This experience may include knowledge or experience with hazards or conditions in the workplace or similar workplaces, or language or communication skills to ensure an effective and thorough inspection. These revisions better align OSHA’s regulation with the OSH Act and enable the agency to conduct more effective inspections.

The rule is in part a response to a 2017 court decision ruling that the agency’s existing regulation, 29 CFR 1903.8(c), only permitted employees of the employer to be authorized as representatives. However, the court acknowledged that the OSH Act does not limit who can serve as an employee representative and that OSHA’s historic practice was a “persuasive and valid construction” of the OSH Act. Today’s final rule is the culmination of notice and comment rulemaking that clarifies OSHA’s inspection regulation and aligns with OSHA’s longstanding construction of the act.

“Worker involvement in the inspection process is essential for thorough and effective inspections and making workplaces safer,” said Assistant Secretary for Occupational Safety and Health Doug Parker. “The Occupational Safety and Health Act gives employers and employees equal opportunity for choosing representation during the OSHA inspection process, and this rule returns us to the fair, balanced approach Congress intended.”

The rule is effective on May 31, 2024.

Learn more about OSHA.

Original Release: March 29, 2024

Source: https://www.osha.gov/news/newsreleases/national/03292024
Beginning in 2024, an adjustment was made to the BLS renewal and exam fees in order to offset the effects of inflation on operating costs, as these fees have not been increased since 2016.

The 2024 fee schedule is as follows:

- **Renewal Fee**: $165 (Due the third year of certification with CM worksheet)
- **CMLSO Exam Fee**: $225
- **CLSO Exam Fee**: $325
- **Application Fee**: $55
- **Late Fee**: $55
- **Rescheduling Fee**: $55

* Note that those whose certification cycles expire December 31, 2023 who renew during the grace period will pay the 2023 renewal fee. Those who expire December 31, 2024 will be subject to the new renewal fee. If you have questions, please do not hesitate to contact our office.

Looking for a way to earn BLS CM points for free? BLS is inviting CLSOs and CMLSOs to share laser safety knowledge with the laser community! Published article submissions are worth 0.5 BLS Certification Maintenance (CM) points in Category 3. For more information on guidelines and regulations, email us at bls@lasersafety.org.

The mission of the Board of Laser Safety (BLS) is to provide a means for the recognition of laser safety professionals through certification and to promote competency in the field of laser safety. BLS certification will enhance the credibility of a designated Laser Safety Officer, and demonstrate that individuals serving in the field have agreed to adhere to high standards of safety and professional practice. For the employer, having a CLSO or CMLSO on staff demonstrates due-diligence and helps to ensure legitimacy and adequacy of the laser safety program, validating the company’s dedication to a safe working environment for all employees.