

# LIA

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# TODAY

TRENDING IN THE  
NEWS: TOP 4 ARTICLES

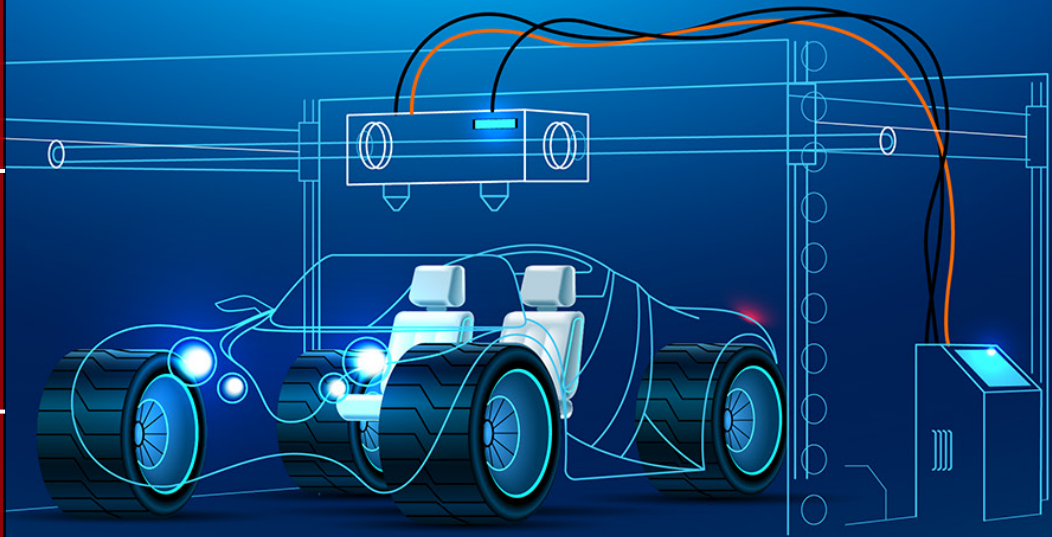
PG 9

LIA CELEBRATES THE  
INTERNATIONAL DAY  
OF LIGHT

PG 12

STRATI: THE FIRST  
3D PRINTED CAR:  
AN INTERVIEW WITH  
RICHARD NEFF

PG 16



# LIA TODAY

THE OFFICIAL NEWSLETTER OF LIA

LIA TODAY is published bimonthly to educate and inform students and professionals of challenges and innovations in the field of photonic materials processing.

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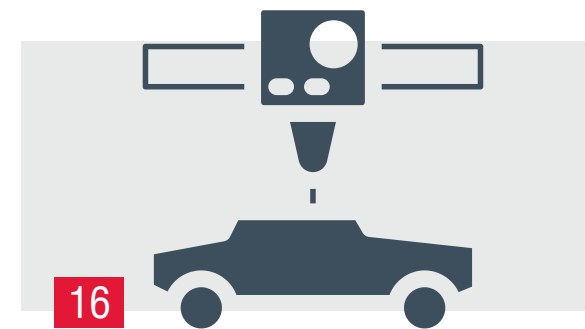
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### LIA CELEBRATES THE INTERNATIONAL DAY OF LIGHT

To celebrate the International Day of Light on May 16, we sent out a survey on light and lasers - these are your answers.



### STRATI: THE FIRST 3D PRINTED CAR: AN INTERVIEW WITH RICHARD NEFF

By Zack Brown

The Strati is the first 3D printed car, but what exactly does 3D printing a car entail? Zack Brown interviews one of the brains behind the car, Richard Neff, about Strati's creation. at IMTS in 2014.



### OSHA EXTENDS NATIONAL EMPHASIS PROGRAM TO PROTECT HIGH-RISK WORKERS FROM CORONA

The U.S. Department of Labor's Occupational Safety and Health Administration is extending its Revised National Emphasis Program for COVID-19 until further notice.

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# LIA Laser Safety Trainings

## LASER SAFETY OFFICER TRAINING

Orlando, FL	Feb. 16 - 18, 2022
Orlando, FL	May 11 - 13, 2022
Orlando, FL	Aug. 17 - 19, 2022
Orlando, FL	Nov. 2 - 4, 2022

## LASER SAFETY OFFICER WITH HAZARD ANALYSIS

Orlando, FL	Feb. 21 - 25, 2022
Orlando, FL	May 16 - 20, 2022
Orlando, FL	Aug. 22 - 26, 2022
Orlando, FL	Nov. 7 - 11, 2022

## MEDICAL LASER SAFETY OFFICER TRAINING

Orlando, FL	Feb. 19 - 20, 2022
Virtual, Instructor Led	April 30, 2022
Orlando, FL	May 14 - 15, 2022
Orlando, FL	Aug. 20 - 21, 2022
New York, NY	Sep. 24 - 25, 2022
Orlando, FL	Nov. 5 - 6, 2022
Virtual, Instructor Led	Dec. 3, 2022

## INDUSTRIAL LASER SAFETY OFFICER TRAINING

Novi, MI	Feb. 9 - 10, 2022
Novi, MI	May 11 - 12, 2022
Novi, MI	Aug. 10 - 11, 2022
Novi, MI	Nov. 9 - 10, 2022

## Course Highlight

### MEDICAL LASER SAFETY OFFICER TRAINING NEW YORK, NY - SEPTEMBER 24-25, 2022

Are you an RN, OR supervisor, surgical tech or training coordinator who has been assigned the critical responsibility of LSO in a medical facility? According to the ANSI Z136.3 (2018) Safe Use of Lasers in Health Care, a Medical Laser Safety Officer, or MLSO, is required if your facility uses lasers of Class 3B or 4. 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.

Risk of not having an MLSO:

- Severe injury/death to patients and staff
- Lawsuits/litigation
- Administrative and regulatory penalties
- Damage to credibility and reputation

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 2-day course will be hosted by Mt. Sinai Hospital at their facility in New York, NY.



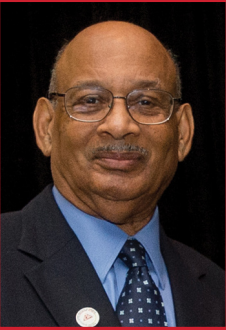
Visit [www.lia.org](http://www.lia.org) for all course and event listings



**Henrikki Pantsar**  
LIA President 2022

## PRESIDENT'S MESSAGE

Summer time and the living is easy... or is it? I guess that depends on how you look at it. The outlook on the world economy is changing all the time and while there are talks about recession, there are still a lot of optimism, especially in the North American market. Supply chains are a headache for all industries, but considering how much manufacturing is still going on amid all the disruptions, it is actually quite impressive. Many people are working extra hard to make things happen and keep wheels in motion. With that, it is also important to take some time off from lasers and all other cool technologies every once in a while. My thoughts are already out of the office, as I sit at the Detroit airport heading out of town. I hope all of our members have vacations planned and list of summer events to attend. I wish everyone a great summer. Take it easy and take some time to enjoy!



**Nat Quick**  
Executive Director

## EXECUTIVE DIRECTOR'S MESSAGE

Hello everyone,

I hope everyone is enjoying their summer so far. We were very fortunate to have staff be able to attend a number of conferences these past two months, including RAPID + TCT, ALAW, FABTECH Canada, and LASYS in Germany. At FABTECH Canada we had the continued honor of being the on-site Laser Safety Officer and at LASYS we were finally able to again connect face-to-face with some of our European members. Thank you to everyone who stopped by our booths to say hello.

As we had the honor of hosting the Advancements in Laser Additive Manufacturing and Influences Across Industry panel at RAPID + TCT this year, Steven Glover has written a brief account on what was discussed and how it went. We appreciate the participation of all panelists: Neil Ball, Youping Gao, Mike Lander, and Richard Neff. The feature of this issue is an interview with the one of the panelists Rick Neff who reflects on a past International Manufacturing Technology Show (IMTS) when the first car was 3D printed on the show floor.

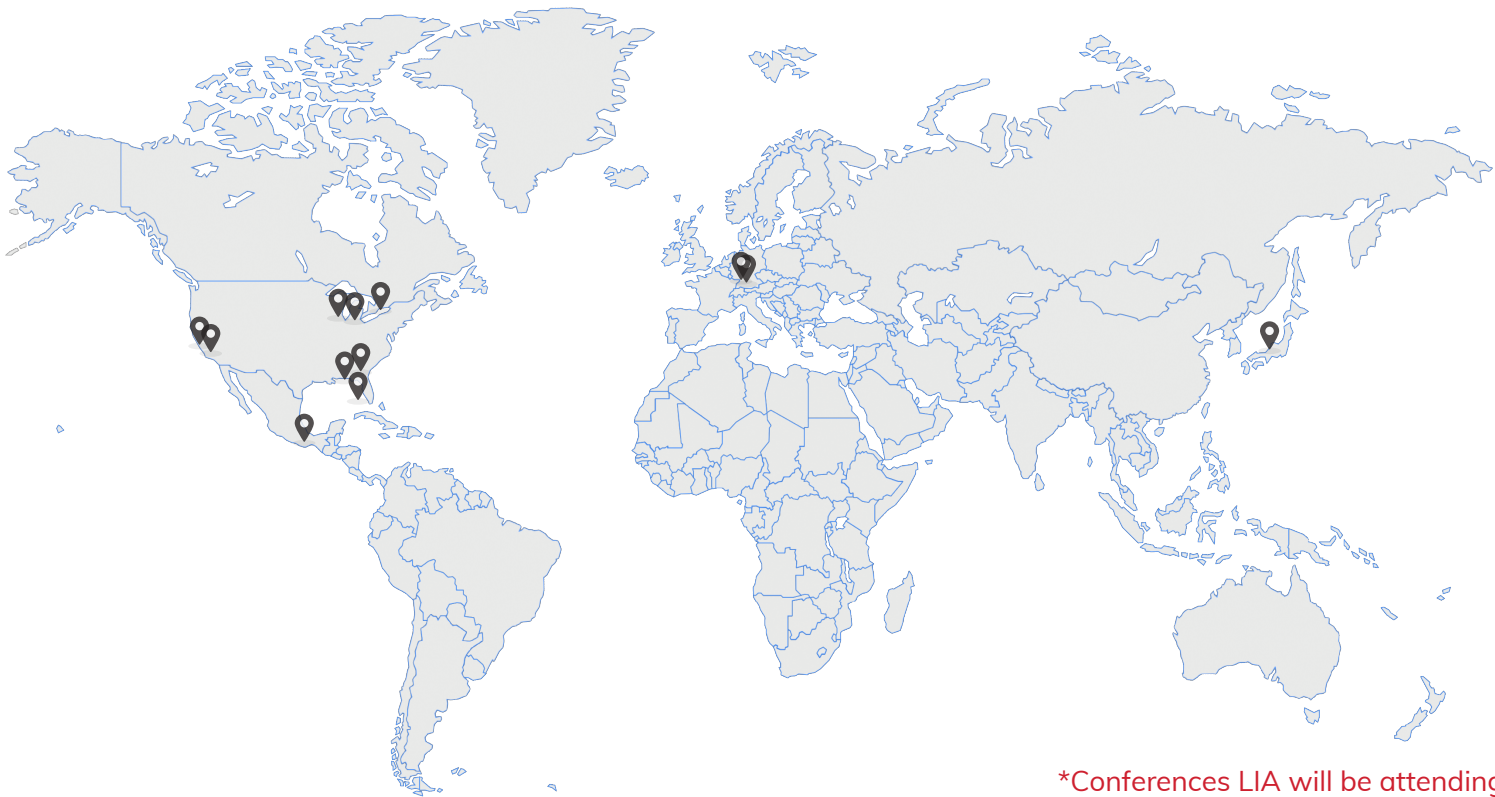
Additionally, our next Laser Safety Webinar is in the works. It will be geared toward medical laser safety and is set to be held sometime in August. We also have two new Medical Laser Safety Officer training courses added to the calendar. One will be hosted at Mt. Sinai in New York, NY on September 24-25 and the other will be another virtual training over Zoom, taking place on December 3rd. Whether you are medical personnel who needs training, a refresher course, or BLS CM points, we hope to see you at these events.

Also in this issue, we have another CREOL Student Spotlight! Find out more about Isabelle Labron, who is an undergraduate student studying Photonic Engineering.

Stay safe and keep others safe.

A Look Ahead at Upcoming Laser Industry Conferences!

- AORN - Mar 19-23, 2022 (New Orleans, LA, USA)\*
- AMUG - April 3-7, 2022 (Chicago, IL, USA)
- MD&M West - April 12-14, 2022 (Anaheim, CA, USA)
- COLA - April 24-29, 2022 (Matsue, Japan)
- Laser World of Photonics - April 26-29, 2022 (Munich, Germany)
- Fabtech Mexico - May 3-5, 2022 (Mexico)\*
- AKL - May 4-6, 2022 (Aachen, Germany)
- RAPID + TCT - May 17-19, 2022 (Detroit, MI, USA)\*
- ALAW - June 7-9, 2022 (Plymouth, MI, USA)\*
- Fabtech Canada - June 14-16, 2022 (Toronto, OT, Canada)\*
- LASYS - Jun 21-23, 2022 (Stuttgart, Germany)\*
- IMTS - Sept 12-17, 2022 (Chicago, IL, USA)\*
- Industrial Laser Conference at IMTS - Sept 14**
- ICALEO, Oct. 17-20, 2022 (Orlando, FL, USA)**
- Fabtech - November 8-10, 2022 (Atlanta, GA, USA)\*



\*Conferences LIA will be attending.

Cooperating Conferences



LIA is proud to be the on site Laser Safety Officer for the Fabtech conferences this year.

A Look Ahead at LIA's Upcoming Events!

International Congress on Applications of Lasers & Electro-Optics

Early Bird Registration is Now Open! You won't want to miss out on this year's ICALEO Conference in Orlando, FL. Our early bird Full Registration price is only \$1050 (\$995) until August 1! Network with laser professionals and experts from all around the world while enjoying this premier platform for breakthrough laser solutions!

This year's conference is themed around laser technology in space with related presentations, plenary speaker astronaut Dr. Don Thomas, and the exciting opportunity to join us on an excursion to the Kennedy Space Center, sponsored by TRUMPF, Inc. and BOS Photonics!

Sponsor and exhibitor opportunities are still available! ICALEO's sponsorship packages provide the best platform to leave a lasting impression on conference attendees. Each level of sponsorship offers you a unique selection of conference events or materials to sponsor. Claim your choice of sponsorship before it's sold!

Exhibition space is also available for you to showcase your company. We are excited to announce the return of the four-hour exhibitor reception Tuesday, October 18 after the show.

Email [sglover@lia.org](mailto:sglover@lia.org) if you are interested.

To stay updated on this event, please visit [icaleo.org](http://icaleo.org).

Industrial Laser Conference at IMTS 2022

The Industrial Laser Conference is a one-day conference taking place on Wednesday, September 14, 2022 as a part of IMTS in Chicago, IL. Presented by LIA, this conference will teach you how to incorporate lasers into your manufacturing processes to stay competitive in the current high-tech market.

Early Bird Registration - \$315 (until August 12, 2022)  
Standard Registration - \$395 (after August 12, 2022)

To stay updated on this event, please visit [imts.com](http://imts.com).

Laser Safety Webinar

LIA is having another Laser Safety Webinar, this time geared towards the medical field. The event structure will replicate April's webinar with two presentations and time for Q&A, lasting about an hour in total.

Tactical Training for Laser Operators and Users  
Richard Gama, CST / CMLSO  
Common Procedures for Lasers in Surgery  
Kay Ball, PhD, RN, CNOR, CMLSO, FAAN

To stay updated on this event, please email [lia@lia.org](mailto:lia@lia.org)



LASER SAFETY GLASSES  
IPL PROTECTION GLASSES  
X-RAY RADIATION GLASSES  
WELDING SAFETY GLASSES  
LASER POINTER PROTECTION



**LASER IN USE**

BEAM DUMPS  
SIGN CONTROLLERS  
BARRIER-MOUNTED LCA KITS  
LASER SAFETY SIGNS  
LASER SAFETY LABELS  
INTERLOCK SYSTEMS  
FUME EXTRACTION



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LASER VIEWING WINDOWS  
WELDING WINDOWS  
RANGE BLOCKING WINDOWS  
LASER VIEWING PANELS



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UV DETECTORS  
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Keyhole

1 mm

Civan Lasers has delivered an OPA 6 dynamic beam laser to the University of Stuttgart's IFSW that will enable researchers to view inside the melt pool during the laser welding process.

A hand holding a quill pen is shown writing on a surface. The surface is covered with mathematical symbols and equations, including the expression  $\mathbf{n}_i \times \left( \sum_{(j)} S[J_{ij}(t), \mathbf{n}_j + \mathbf{D}_{ij}(t) \times \mathbf{n}_i] \right) + \mathbf{n}_i \times (\mathbf{B} + g \langle \hat{\mathbf{s}}_i \rangle)$  and the equation  $i_j(t) + i_j[H_s(t) + H_{s-d}(\mathbf{n}(t)), \rho(t)]_{ij} = 0$ .

Research at Lund University in Sweden has found a new way to create nano-sized magnetic particles using ultrafast laser light pulses.

Researchers have developed a new imaging-based technique for removing arterial plaque in patients with atherosclerosis that includes a low-power laser that works together with ultrasound technology.

A liquid silica resin (LSR) developed by researchers at the University of Arizona has proven successful as a 3D-printing medium for complex micro-optics.

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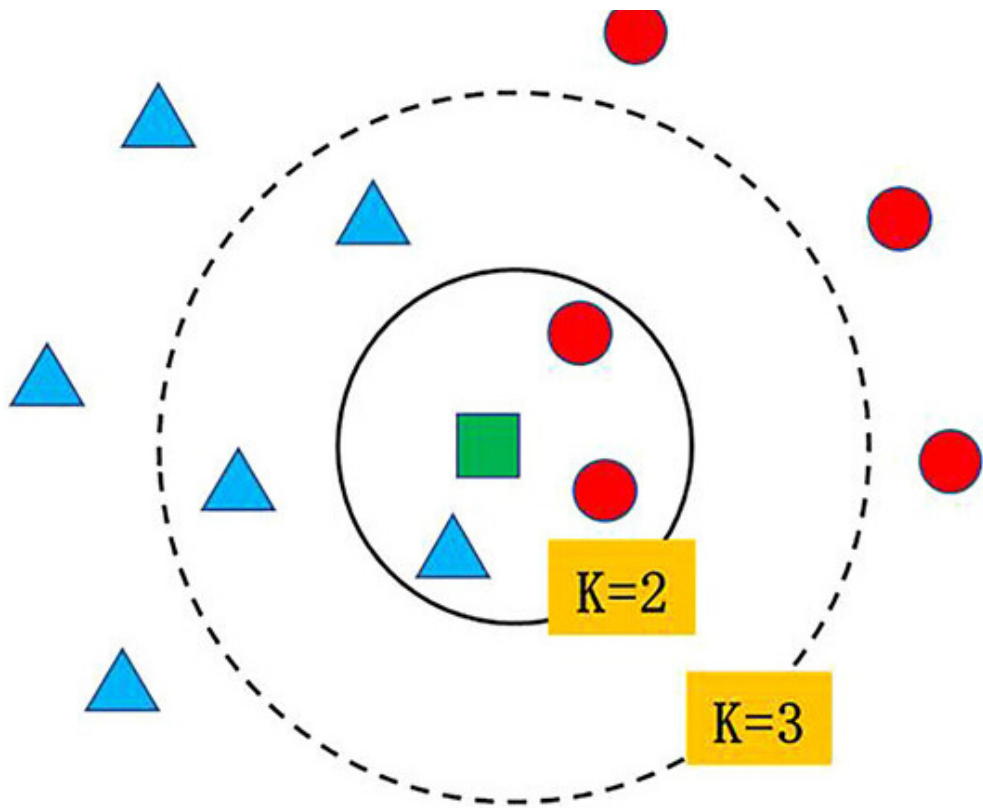


FIG: Schematic diagram of K-nearest neighbor relationships. The green square indicates the test sample, and red dots and blue triangles represent different known data categories

# ONLINE DETECTION OF LASER PAINT REMOVAL BASED ON LASER-INDUCED BREAKDOWN SPECTROSCOPY AND THE K-NEAREST NEIGHBOR METHOD

By: Jianfeng ShangGuan, Yanqun Tong, Aihua Yuan, Xudong Ren, Jianfeng Liu, Hongwei Duan, Zhaohua Lian, Xiaocai Hu, Jian Ma, Zhen Yang, and Dongfang Wang

**Abstract:** Laser paint removal is a new highly efficient and environmentally friendly cleaning technology. Compared with traditional paint removal methods, laser paint removal is less labor intensive and can reduce environmental pollution. During laser paint removal, real-time monitoring is necessary to ensure efficient cleaning and process automation. Current methods for real-time monitoring of laser paint removal only determine whether the sample surface has been cleaned but provide no information on the status of any residual paint. In this article, spectral data of the sample surface have been obtained using laser-induced breakdown spectroscopy. It is shown that Zn and Fe spectral lines can be used in real time to characterize the effectiveness of paint removal and that the intensities of characteristic spectral lines are positively correlated with the single-pulse energy of the excitation light. The K-nearest neighbor algorithm was used to evaluate

and automatically classify the extent of cleaning of sample surfaces in real time. When K = 3, the classification accuracy of distinguishing different levels of cleaning was 100%. The results of this study provide technical support for automatic and intelligent laser paint removal.

**Journal of Laser Applications 34, 022009 (2022);**  
<https://doi.org/10.2351/7.0000597>

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**Visit JLA Online:** <https://lia.scitation.org/journal/jla>



**Name:** Isabelle Lebron  
**Hometown/State:** Tarpon Springs, FL  
**Year in School:** : Junior Undergraduate  
**Area of Study/Major:** Photonic Engineering

# STUDENT SPOTLIGHT

**When were you first introduced to photonics/electro-optics?**

☞ I was first introduced to photonics through my high school physics teacher and Mike McKee. They took us on a field trip to Disney World and explained many applications of physics within Disney's park and how we could apply it to what we were learning in the classroom. A memorable moment would be when they took us underneath The Haunted Mansion and explained how they were able to create ghosts through tricks of light. ☹☹

**What or who inspired you to choose your line of study?**

☞ I initially wanted to study mechanical engineering, but upon learning of the photonics program at UCF I asked my physics teacher if he thought I would be a good fit for the program. He said he believed I would excel and his words have never left me. He continues to inspire me today. ☹☹

**Describe your favorite course you have taken so far.**

☞ My favorite course would have to have been the lab for Geometric Optics. It was my first true introduction to the field of photonics and it allowed me to explore what particular area of study I would like to focus. ☹☹

**Are you researching anything at the moment? Can you tell us about it?**

☞ I am currently a part of research here at UCF and am assisting in the development of the Chromorphous fabric, an innovative color-changing eTextile that can be controlled via a smartphone. ☹☹

**What would you like to do in the future with your studies?**

☞ In the future I plan on attending graduate school with research in Fiber Optic communication and eventually use my knowledge to further the field of Optics and Photonics. ☹☹

What is your favorite use of light?

Turning darkness into daylight when riding my mountain bike at night with my LED lights. - John B.

Growing plants/flowers - Ronilee H.

To brighten spaces - Julia K.

Solar power - Meghan A.

What is some laser related news that you have read recently that you find interesting or exciting?

The use of two remote Fourier-transform infrared spectroscopy (FTIR) imaging systems to create 3D images of leaked gas clouds aiding in detection and identifies its location, volume, and concentration. - Nicoyri T.

300 kW laser being tested by the US Army to shoot down missiles. - John B.

Comparative treatments of a green tattoo ink with Ruby, Nd:YAG nano- and picosecond lasers in normal and array mode - Dr. André B.

Telsa working on laser windshield wipers - Meghan A.

Kind of dangerous news, that there has been an increase of arrests made recently of civilians shining lasers at airplanes and helicopters while in flight. - Ronilee H.

What is your favorite use of lasers or laser related technology?

It's a toss up between the use of lasers in entertainment and the use of lasers in environmental protective efforts. - Nicoyri T.

pigment removal (tattoo & pmu) - Dr. André B.

Retinal Care - Simon

Laser engraving - Julia K.

Material processing: I have been helping manufacturers solve challenging welding, cutting, marking and machining applications for 40 years - John B.

The strides laser technology has made in the medical field. Fixing eye sight, dental surgeries, using lasers in surgery, etc. - Ronilee H.

How are you most excited/hoping to see laser technology advance in the future?

Seeing more industrial lasers being adopted for traditional applications i.e mig/tig/arc welding due to ease of use and lower cost. - John B.

Make laser tattoo removal procedures safer and more effective than present approaches. While the approach has not changed much in the previous 50 years, it may actually lower the cost and increase its accessibility to those who require it. - Dr. André B.

I am most excited to see laser technology advance because it does so many things I didn't know were possible. And this technology is opening doors and possibilities to solve problems, aid in productivity, and enhance manufacturing. - Nicoyri T.

I can't wait to see how much more lasers can do in space. - Ronilee H.

More Ophthalmology Laser Treatments - Simon



# Advancements in Laser Additive Manufacturing and Influences Across Industry -Hosted by LIA

A Recap by Steven Glover, The Laser Institute

I was able to attend RAPID + TCT in Detroit, Michigan this past May. If you have any interest in additive manufacturing, this conference is one you should plan to be at. There are additive manufacturing solutions in a variety of industries such as aerospace, defense, automotive, medical, and other consumer products. This year's conference was well attended and those in attendance were excited to be back together again in person. There were nearly 400 exhibitors. I took advantage of the opportunity to catch up with many of our LIA members. While attending the conference I moderated a panel session at the SME Zone Theatre. LIA hosted the panel discussion, Advancements in Laser Additive Manufacturing and Influences Across Industry, which consisted of Panelists Rick Neff of Rick Neff LLC, Mike Lander of Skyward, Ltd, Youping Gao of Casteon Inc, and Neil Ball of Directed Light. These experts provided information on how lasers have and continue to have a positive effect on various industries. The panel was well attended and the underlying theme across the panelists was the necessity of in-person events like RAPID + TCT that encourage collaboration. All panelists agreed that collaboration is a requirement for continued advancements and growth.



The 2023 RAPID + TCT event will be held at McCormick Place in Chicago, May 2-4. LIA looks forward to participating next year. I hope to see you there!



## OSHA extends National Emphasis Program to protect high-risk workers from coronavirus

WASHINGTON – The U.S. Department of Labor's Occupational Safety and Health Administration is extending its [Revised National Emphasis Program for COVID-19](#) until further notice. The program focuses enforcement efforts on companies that put the largest number of workers at serious risk of contracting the coronavirus, and on employers who engage in retaliation against workers who complain about unsafe or unhealthful conditions or exercise other rights under the Occupational Safety and Health Act.

OSHA is also temporarily increasing the coronavirus inspection goal from 5 percent of inspections to 10 percent, while it works to finalize a permanent coronavirus health care standard. The program was set to expire July 7, 2022.

The Centers for Disease Control and Prevention has reported increasing coronavirus hospitalization rates nationwide since mid-April, and data forecasts that hospitalizations may increase significantly in the coming weeks. This increase in hospitalizations reinforces the need for OSHA to continue prioritizing

inspections at workplaces with a higher potential for coronavirus exposures, such as hospitals, assisted living facilities, nursing homes, and other healthcare and emergency response providers treating patients with coronavirus.

First launched in March 2021, the National Emphasis Program will also continue to cover non-healthcare industries, such as meat and poultry processing.

From March 2021 to March 2022, inspections under the revised program accounted for 7 percent of all federal OSHA inspections, exceeding the national emphasis program's 5 percent goal. Since the beginning of the pandemic in Feb. 2020, OSHA has issued 1,200 coronavirus-related citations to employers and to date assessed current penalties totaling \$7.2 million dollars. OSHA has also obtained relief for more than 400 employees who filed coronavirus retaliation claims against employers, exceeding \$5 million in monetary awards to employees.

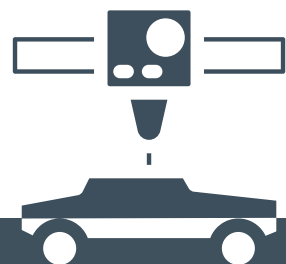
OSHA encourages State Plans to continue implementing an

emphasis program for coronavirus inspections that are at least as effective as federal OSHA's Revised National Emphasis Program. Additionally, OSHA continues to work expeditiously toward a permanent standard to protect healthcare workers from coronavirus hazards and an infectious disease standard to ensure that workers are better prepared for any future outbreak.

Learn more about OSHA's [coronavirus resources](#).

The mission of the Department of Labor is to foster, promote, and develop the welfare of the wage earners, job seekers, and retirees of the United States; improve working conditions; advance opportunities for profitable employment; and assure work-related benefits and rights.

Original Release: June 30, 2022  
Source: <https://www.osha.gov/news/newreleases/trade/06302022>



# Strati: The First 3D Printed Car

## An Interview with Richard Neff

By Zack Brown

The Strati is the first 3D printed car, but what exactly does 3D printing a car entail? One of the brains behind the car, Rick Neff, answers questions about Strati's creation at the International Manufacturing Technology Show in 2014.

Q. Can you describe the process of creating the Strati?

A. The idea for Strati started in late 2013 or early 2014 when Big Area Additive Manufacturing (BAAM) was being developed at Oak Ridge National Laboratory (ORNL) Manufacturing Demonstration Facility (MDF), where they were working with Lockheed Martin to create 3D printed tooling. They had an extruder on a robot and were challenged with programming, so the team at the MDF, including Lonnie Love, Chad Duty, and Brian Post took the extruder and put it on a gantry that had been used for several projects already. They were quickly printing parts, but neither ORNL nor Lockheed Martin wanted to be in the 3D Printer business, so they struck a system by removing the laser and beam delivery and replacing them with a plastic extruder as a shortcut to creating a giant 3D printer.

John B. Rogers (Jay), the founder of Local Motors (LM), saw the system and asked if they could work together to 3D print a car. In March 2014, everybody said yes, but nobody knew how it could be accomplished. The Association for Manufacturing Technology (AMT) agreed to provide a venue at the Emerging Technology Center in the atrium of McCormick Place at the International Manufacturing Technology Show (IMTS), the largest machine tool show in North America. This gave a hard deadline to build the car at a trade show in front of 114,000 people in September 2014. Additional partners included SABIC Innovative Plastics, which ordered a BAAM and agreed to have their machine at IMTS. SABIC and Techmer PM provided a carbon fiber-reinforced Acrylonitrile Butadiene Styrene (ABS) for the project. Thermwood Corporation built a 5-Axis milling machine and provided support for programming and machining. To support the project, ORNL utilized a team of mechanical engineers, materials engineers, and engineering interns to develop a new machine, new processes, and new programming software.

One of the keys to designing an all-new car was something Local Motors called Co-Creation. They developed a cloud-based software program that fostered design collaboration. The Local Motors design community could submit ideas for a 3D printed community electric vehicle that could fit on the table

*"[Local Motors] developed a cloud-based software program that fostered design collaboration."*

of the BAAM. As it turned out, LM got over 200 great looking designs. The seemingly straightforward task of picking a design took a dedicated team to sift through all the designs and their iterations and feedback on each design was provided by the design community. The hands-down winner was a design called the Strati, designed by Michele Anoe. Anoe, from Italy, called it Strati, meaning layers. He won a small cash prize and a trip to Chicago to see his car being built at IMTS.

Then the real work began with ORNL printing some smaller parts that were assembled to make a mule to test the idea of a printed frame with a potential drive system. The drive was taken from a Renault Twizy electric city car, and the mule worked.

In August, the team at ORNL attempted to print a whole car. It took over 100 hours and was manned around the clock by interns and Ph.D. scientists alike. Extraordinary measures were needed to keep the print head from crashing into plastic nubs that stuck up at the end of each layer. The car took so long to print that the lower layers had cooled too much to allow for good layer-to-layer bonding. In the end, the entire vehicle split apart between the layers. With only a month before IMTS, some real innovation was needed.



YouTube - "Strati at IMTS 2014 - What will you create?"



IMTS Team with nearly completed Strati

For the layers to stick together, they had to print faster, and a bigger extruder was needed. A consultant, Tim Womer, determined that we could modify the extruder screw and double the output without overloading the drive. A new extruder screw was machined and delivered to Chicago to the show for installation on the machine. Vlastimil Kunc at ORNL took on modeling the process to determine if the new extruder would work. With help from AlphaStar, a complete process simulation showed the stresses that would result from printing with the new screw, and it seemed like it might work.

*"Saturday morning of the IMTS, Jay Rogers at the wheel and Doug Woods, the president of AMT, drove the Strati out of McCormick Place and to a press conference in front of the main entrance."*

There was still the issue of the head crashing on the carbon-reinforced nubs that stuck up every time the head retracted. An intern at the MDF, Andrew Messing, a sophomore at the University of Tennessee, wrote a subroutine for the ORNL slicing software. The subroutine programmed a swirling motion just before the head retracted. This allowed the tamper on the head to smooth out the nub before it hardened. This new programming software and the new extruder were calibrated and tested on the IMTS show floor just days before the show.

The AMT and the Freeman staff at McCormick Place had to take extraordinary measures to help pull off the project. The process couldn't be stopped, so in response the team had to leave power running to the machine and provide safety staff round the clock.

The day before the opening to the public was press day. The print was started first thing

in the morning. Everybody on the team was interviewed dozens of times that day by every news outlet you could imagine. Everybody was running on pure adrenaline and caffeine after a three-month sprint to the event. Would it work? It was amazing. The head did not crash. One small crack that appeared near the bottom of the print caused a few issues that were quickly overcome. We were done printing the car's main body on the second day, and the crowds showed up. Nobody had ever seen anything like BAAM. Early on the third morning the print was finished.

The excited team moved it to the Thermwood machine before the crowds poured in on the third day. This was the first time that a part of this size was ever machined. Thermwood technician Brent East found that the surfaces were not exactly where the software said they would be. Nonetheless, Brent innovated on the fly, and the finished Strati looked great. It has smooth sections that were machined, and it has raw layered sections as a design element.

The Local Motors team then added the drive system, suspension, seats, lights, and other details. One of the concessions to printing faster was to leave the fenders off for the main prints. As it turns out, the fenders print better on their side, eliminating the need for support material. When the car was first assembled, the front tire hit the fender when the wheel was turned. The design team sprung into action, and the fender was redesigned, reprinted, and replaced in a few hours.

Saturday morning of the IMTS, Jay Rogers at the wheel and Doug Woods, the president of AMT, drove the Strati out of McCormick Place and to a press conference in front of the main entrance.



Strati outside IMTS at a press conference. (Rick Neff in red)

Q. Is there anything you would have done differently if given the opportunity?

A. No. There were probably over 1,000 innovations that happened during the development process. If any one of them had not happened, the Strati would have probably failed. The combination of so many diverse and talented people accelerated innovation. No car, machine, lab, or plastics company could have made this happen independently. It was a genuine collaboration. Without funding from the Department of Energy Advanced Manufacturing Office backing the MDF, it wouldn't have happened, and it all started with a moonshot challenge by Jay Rogers.

"There were probably over 1,000 innovations that happened during the development process."

Q. How does the vehicle operate now?

A. In Chicago it ran well in front of the crowd. The Strati had the drivetrain removed and it was turned into a display by Local Motors. It rolls on removable castors.

Q. How did you acquire the Strati?

A. Local Motors pursued the dream of 3D printing vehicles in production. They found some commercial success with their Olli, a small autonomous bus. They were using additive manufacturing (AM) to make the structure of the vehicle. Alas, the sensors and software to facilitate autonomy did not mature as fast as expected, and Local Motors could not sustain its business in the meantime. They closed their micro-factory in Tennessee and proceeded to auction off all of their assets. The non-functioning original Strati was within my budget, so I snapped it up in hopes of saving it from the dumpster.



Strati In Cincinnati 2022

Q. What future plans do you have for the Strati?

A. After IMTS, it went on tour and visited the North American International Auto Show, the Today Show, the SEMA Show, and NPE the Plastics Show. A subsequent Strati was even on Jay Leno's Garage. I'm hoping that people will want it for events. I can haul it to trade shows, car shows, and conferences in the state it is in. It might be an excellent attraction for a parade if I can make it drivable.

Q. How do you believe laser 3D printing could play a part in the future of vehicles?

A. One company, Czingier, is pushing the limits of what you can do with laser additive manufacturing in vehicle design and manufacturing. I recently heard their founder, Kevin Czingier, speak about the 21-C hypercar, and they are utilizing AM for all it's worth. They are making large parts using laser powder bed fusion, and it is paying off. They have grounds to say that they are making the world's fastest production car. Laser powder bed fusion has allowed them to produce a light, strong, and stiff vehicle. It has allowed them to innovate and control their supply chain.

Q. What're your thoughts on other 3D printed vehicles, like the YoYo by XEV?

A. The Yoyo is an interesting vehicle. They use a combination of additive and traditional manufacturing. They use AM for the dashboard and some customizable trim on the outside of the vehicle. Additive Manufacturing is being used for mass customization of luxury and racing vehicles today. I am excited to see where it will go.

Have a story about laser 3D printing? Contact us at [marketing@lia.org](mailto:marketing@lia.org) to get your story published.

Rick Neff  
Consultant/CEO  
Rick Neff, LLC



# INDUSTRIAL LASER CONFERENCE 2022

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"The connections and friendships forged with other LIA members, at the ICALEO conference and other LIA events."

"The exposure to all of the knowledge provided by LIA. Whether it is training, conferences, or networking opportunities."

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# NEWSLETTER

Volume 3 • Issue 1

## Recently Certified

Kristi Powell - CMLSO

Laura Rubel - CMLSO

M. Leah Allred

Caleb Llanaeza - CLSO

Masahiro Kamei - CLSO

Tristan White - CLSO

John Snow - CLSO

Lorna Omenya - CMLSO

Omar Bobes - CMLSO

Kelly Earl - CMSLO

Daniel Gottreich - CLSO

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Email: [bls@lasersafety.org](mailto:bls@lasersafety.org)  
Website: [www.lasersafety.org](http://www.lasersafety.org)

## 14th DOE LSO Workshop - Sept. 13-15, 2022

The Department of Energy Laser Safety Officer Workshop is for individuals with laser safety responsibility and interest in a research or academic setting who want to update and expand their knowledge.

The 2.5 day meeting will take place at Lawrence Berkeley National Laboratory in Berkeley, CA

The Board of Laser Safety will offer its Certified Laser Safety Officer (CLSO) and Certified Medical Laser Safety Officer (CMLSO) examinations prior to the workshop on Monday, September 12th, 2022. Contact [Liliana Caldero](mailto:Liliana.Caldero@lbl.gov) for more information.

For more information, visit <https://sites.google.com/lbl.gov/14doelsoworkshop/home>, or contact us at [bls@lasersafety.org](mailto:bls@lasersafety.org).

## New ANSI Z136.1 for Safe Use of Lasers Coming Soon!

The ANSI Z136.1 for Safe Use of Lasers is being updated this summer! Order your 2022 copy SOON to stay current with your laser safety practices!

This is the parent document and cornerstone of the Z136 series of laser safety standards. It provides guidance for the safe use of lasers and laser systems and is the foundation of laser safety programs for industrial, military, medical, and educational applications nationwide.

Find these new standards, as well as the rest, on our website at [lia.org/store/laser-safety-standards](http://lia.org/store/laser-safety-standards)

## International Laser Safety Conference (ILSC) 2023 Dates and Location

Save the Date! The International Laser Safety Conference will be taking place in Portland, Oregon from February 27 - March 2, 2023.

Find out more about the conference at [ilsc.ngo](http://ilsc.ngo).

## Write for BLS!

Looking for a way to earn BLS CM points for free? BLS has restarted it's newsletter and 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](mailto:bls@lasersafety.org). Check out one of our submissions on the next page!

## Upcoming Events to Earn BLS CM Points

After an individual has passed the certification examination, he/she will be required to maintain that certification through approved professional development activities over the 3-year certification period. As the industry changes and technology grows, so too must the knowledge of the CLSO and CMLSO. The BLS only recognizes BLS Certification Maintenance (CM) points and may award these points for eligible laser-related activities.

The following are some of these upcoming laser-related events.

You can visit the Board of Laser Safety website at [lasersafety.org](http://lasersafety.org) for more information on certification maintenance and the new extension year or watch the following informative video that was made by the BLS staff for your convenience.



You can also download the Certification Maintenance Manual [here](#).

### Medical Laser Safety Workshop

LIA is having another Laser Safety Webinar, this time geared towards the medical field. The event structure will replicate April's webinar with two presentations and time for Q&A, lasting about an hour in total.

#### Tactical Training for Laser Operators and Users

Richard Gama, CST / CMLSO

#### Common Procedures for Lasers in Surgery

Kay Ball, PhD, RN, CNOR, CMLSO, FAAN

This event is worth 0.25 BLS CM points if you attend both presentations and complete the required post-attendance form.

Email [lia@lia.org](mailto:lia@lia.org) for more information.

### 14th DOE LSO Workshop - Sept. 13-15, 2022

The Department of Energy Laser Safety Officer Workshop is for individuals with laser safety responsibility and interest in a research or academic setting who want to update and expand their knowledge. It features presentations on current laser applications, and associated laser safety issues and solutions. Certification Maintenance points for Workshop participation will be available.

The request to approve points/credits for the 2022 DOE LSO Workshop will be made at the conclusion of the workshop. BLS has previously awarded 2.5 CM points.

### LIA Classroom Courses for BLS CM Points

The following classroom courses are available to get BLS CM points:

#### Industrial Laser Safety Officer Training,

August 10-11, 2022-Nov, MI  
November 9-10, 2022-Nov, MI  
Laser Safety Officer Training

August 17-19, 2022-Orlando, FL  
November 2-4, 2022-Orlando, FL

#### Laser Safety Officer with Hazard Analysis Training,

August 22-26, 2022-Orlando, FL  
November 7-11, 2022-Orlando, FL

#### Medical Laser Safety Officer Training

August 20-21, 2022-Orlando, FL  
September 24-25, 2022-New York, NY

November 5-6, 2022-Orlando, FL  
December 3, 2022-Virtual

Find more information here: <https://www.lia.org/training>

## About BLS



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.

# WANT TO SHARE YOUR IDEAS WITH THE LASER COMMUNITY THROUGH *LIA TODAY*?

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Check out the guest article guidelines below  
and get in touch with an editor today!

## BEFORE YOU SUBMIT:

**Content:** We are always looking for great newsworthy content that covers challenges and innovations in the field of photonic materials processing, laser safety, and laser market trends. This is not a paid opportunity, but does carry the benefit of publishing your work on a platform that is read by thousands of your peers. All article topics should be confirmed with an LIA TODAY editor before writing your article. Please email your article ideas to [liatoday@lia.org](mailto:liatoday@lia.org) and an editor will be in touch with you.

**Potential Categories:** Safety, medical applications, research and development, laser applications fundamentals, history, business, and other categories.

**Potential Industries:** Energy storage, aerospace, DoD non-aerospace, automotive, medical devices and biotechnology, microelectronics and IC fabrication, Internet of Things, research and development, and other industries.

## SUBMISSION GUIDELINES:

**Style:** The tone should be editorial and informative; it should not sound like a sales pitch. It should be comprehensible by a broad audience of readers with low to expert experience with the topic, so it is important to include examples and simple explanations alongside any technical language.

**Length:** 600 - 1500 words

**Text:** Please use standard fonts such as Arial, Calibri, or Times New Roman. Fonts, font sizes, and line spacing will be reformatted by LIA for the final piece. Grammar and mechanics will be edited to the LIA style guide by LIA, but please be mindful of spelling and grammar as you are writing so that your message is clear.

**Headline:** Please include two newsworthy headlines suggestions for your article using action verbs.

**Images & Figures:** Please include images to be used with the article. Submit as an email attachment (PNG, GIF, JPG, JPEG) (min. 1000px in width or height). Images should also be placed in the body of the text where the author would like them to appear in the final article. All figures or images should include captions.

**Deadlines:** All material is due no later than two weeks prior to the scheduled publishing date. Check with an editor for your deadline.

*Note: LIA reserves the right to abstain from publishing a submitted article for any reason.*

## SUBMISSION CHECK LIST:

- Full text as a Word Document
  - Abstract: A 50 – 100 word summary in plain language
  - Two (2) headline suggestions using an action verb
  - Article 600 – 1500 Words
  - Images with captions placed in the body of the article
  - Article references when applicable
  - Short author *bio* (full title, company, 50 words)
  - (optional) Professional headshot of author
- Images attached in one of the accepted file types (.png, .tiff, .jpeg, .jpg) (min. 1000px width or height).