

Community

News

Report: Laser World of Photonics 2022

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The international photonics industry met again in person at Laser World of Photonics 2022 in Munich from April 26 to 29. The world's leading photonics trade fair lent support to an industry that is on the upswing worldwide. For the first time, the World of Quantum also provided a stage for the international quantum community. It also highlighted the central role photonics plays in areas such as medical technology, electromobility, and industrial manufacturing.

Due to the coronavirus-related postponement, Laser World of Photonics took place without the parallel congress; the industry will meet again next year in Munich with the usual format. Dr. Reinhard Pfeiffer, Deputy CEO of Messe München, stated: "The response has clearly exceeded our expectations: More than 15,000 trade fair visitors traveled to Munich. That is a good 80 percent of the level of trade show attendees at the 2019 pre-event, an outstanding result for a trade fair in the time of coronavirus. 39 percent of visitors came from abroad, with the U.S. and Israel leading the way. We are also very pleased with the successful premiere of the World of Quantum, a platform for a future technology that is largely based on photonics and expected to be at least as promising."

"Laser is alive and well again!" says Dr. Wilhelm Kaenders, Chairman of the Exhibitor Board and CEO of TOPTICA Photonics AG. "After three years and having successfully found its way through various crises, the industry can once again show its full innovative capacity. The quantum topic is an opportunity to reopen an old gateway for the future of photonics."

The trade fair reflects an international growth market

The show was an important milestone for an industry on the upswing. Over 900 exhibitors from more than 30 countries made an appearance (2019: 1325 exhibitors from more than 40 countries), including 15 national and international joint stands. After Germany, the top ten exhibitor

countries were U.S., France, Great Britain and Northern Ireland, Switzerland, China, Lithuania, the Netherlands, Canada, Finland, and Japan. The top ten visiting countries from abroad included Switzerland, Italy, Great Britain and Northern Ireland, Israel, France, U.S., Czech Republic, Austria, the Netherlands, and Spain.

"There is immense growth potential for photonics," explains Jörg Mayer, Managing Director of the industry association SPECTARIS. "For the German photonics industry alone, experts in 2020 forecast average annual growth of more than six percent and total sales of almost 60 billion euros by 2025. I am confident that this target will be met, if not exceeded, despite the current global challenges."

Premiere of world of quantum

Held for the first time in its own hall, the World of Quantum quickly won positive feedback: more than 60 percent of all trade fair participants visited this new area, and more than 90 percent of them were excited about the offering of World of Quantum according to a survey carried out by the trade fair. It is currently the world's largest platform for connecting science, industry and users from the field of quantum technology, providing the latest information on current research findings and presenting initial sample applications of this future technology. IBM Quantum gave visitors a look inside its quantum computer using a model. And at the Qiskit Hackathon, organized in cooperation with partners IBM Quantum and the German Federal Ministry of Education and Research, teams of young talent were able to try out programming quantum computers. "The World of Quantum was an immense success," said a delighted Dr. Lechner, Executive Director at Messe München. "Together with our partners, we're off to a great start, and we'll continue down this path together." Dr. Walter Riess, Manager Quantum Technology at IBM Research Europe, added: "The World of Quantum more than exceeded my expectations. I am already looking forward to next year."

Exhibitors delighted to be back at the fair

“After a forced break of more than three years, the trade fair is even more valuable for establishing and maintaining contacts with our customers. The positive response at our booth is clear proof of this,” explains Markus Spanner, CEO Physik Instrumente. Dr. Thomas Fehn, Chief Sales Officer at TRUMPF Laser Technology, says: “Laser World of Photonics is one of the central platforms for presenting our newest ideas and sharing technical information with our international customers.” Jürgen Niederhofer, General Manager MKS Instruments says, “Our expectations with regard to the number of visitors and customer inquiries have been exceeded. The quality of leads is very good and we have had interesting talks.” Benjamin Rudolph, Co-founder of SI Stuttgart Instruments, was a first-time exhibitor with his start-up: “The trade fair is an excellent place to meet and network, and to build new partnerships. What is more, we have exciting leads to take back to Stuttgart with us. We are especially delighted to be honored with 1st place in the Innovation Award.”

Award-winning industry innovations

The Innovation Award was presented for the second time in conjunction with Europa Science. A jury consisting of top experts from industry and science selected the most innovative products in a total of six categories; the SI Stuttgart Instruments was also honored as the overall winner. The winners in the individual categories are Hamamatsu Photonics Germany, Glassomer, SI Stuttgart Instruments, QiOVA, ID Quantique, and Xarion Laser Acoustics.

Exhibition Director Anke Odouli concludes, “The industry once again impressively demonstrated the key role that photonics plays for innovation in many other areas. And our extensive supporting program offered a spotlight for expert discussions and knowledge transfer.”

The next Laser World of Photonics will be held at the Messe München exhibition center from June 27–30, 2023, and the next World of Photonics Congress from June 25–30, 2023. www.laser.de

Report: International Laser Technology Congress AKL’22

From May 4 to 6, 2022, laser manufacturers and users from various industries met for the 13th time at the “AKL – International Laser Technology Congress.” The congress had to be postponed from 2020 to 2022 due to the pandemic. 87 speakers brought participants up to date on the current status and trends in laser technology in production. Whether it’s about productivity increases in additive manufacturing, AI-supported laser systems or networked digital process chains for the smart production of tomorrow, the latest findings of applied research as well as pioneering achievements of the industry were presented and discussed at AKL’22.

The “AKL – International Laser Technology Congress” has established itself in Europe as the leading forum for applied laser technology in production. The AKL’22 also followed the proven structure of previous years: In addition to the core conference, the first day, Wednesday, May 4, 2022, was once again dominated by parallel expert forums that dived deeply into the production topics of additive manufacturing, process monitoring and digitalization. In addition, Fraunhofer ILT devoted itself to photonic issues in quantum technology for the first time. This is an exciting new field that will also have a long-term impact on digitalization issues in production technology, such as the management of big data and AI.

Expert forum “process monitoring & digitalization”: optimizing laser use with AI

The spectrum of research aspects in the field of artificial intelligence (AI) ranges from machine learning in industrial practice to the use of augmented reality and data analysis with neural networks. However, AI was only a small component in the expert forum “process monitoring & digitalization,” which focused on quality control and optimization of various laser manufacturing processes such as cutting, welding, and additive manufacturing.

Expert forum “laser additive manufacturing”: productivity leaps in Am

Participants of the expert forum “laser additive manufacturing” had the opportunity to spend the entire day learning about AM technologies. Initially, the focus was on laser material deposition (LMD). In addition to the question of rapid alloy development, the workflow in laser material deposition was examined in its entirety. Participants also learned how extreme high-speed laser material deposition, or EHLA, has evolved into EHLA 3D.

The second part of the forum focused on laser powder bed fusion (LPBF). For 3D printing to achieve a breakthrough in the manufacturing industry, the entire data chain must be considered. Experts also shed light on simulation tools, process control systems and concepts for increasing productivity.

New: expert forum “quantum technology”

Quantum technologies are currently being advanced internationally with billions of funding. Here, we are at the beginning of a technical revolution that will enable fundamentally new applications. These include quantum imaging, quantum communication and quantum computing. In the expert forum “Quantum Technology,” interested parties gained insight into the current state of research and development. Among other things, this forum highlighted quantum-safe encryption for optical networks and frequency standards for quantum applications as well as the use of quantum technology for inline monitoring. It was of particular interest to see German big tech, namely Robert Stroh from the Robert Bosch GmbH and Sebastian Lubert, Infineon Technologies AG, presenting there.

Laser markets – advances in knowledge for decision makers

At the Technology Business Day, managing directors, marketing managers and strategists received an overview of the laser markets in Europe, Asia, and America with an in-depth look at technological trends in individual areas such as e-mobility, micromanufacturing and 3D printing.

For laser newcomers, Fraunhofer ILT offered the popular Laser Technology ABC’s seminar on May 4, 2022. There, attendees with little or no experience in laser technology receive a structured, hands-on overview: from the

selection of suitable beam sources and handling systems for various applications to safety aspects in industrial laser technology.

In addition, more than 40 speakers from industry and science shed light on the current state of laser technology in the field of macro and micro laser material processing as well as laser beam source development on May 5 and 6, 2022. All AKL’22 participants also had the chance to make contact with around 40 well-known laser, component and system manufacturers at the sponsors’ exhibition accompanying the conference and to discuss their questions in individual meetings.

Innovation Award for Laser Technology 2020/2022 presented

Outstanding innovations in laser technology were presented and honored in the Coronation Hall of Aachen’s City Hall on May 4, 2022. The occasion was the presentation of the Innovation Award for Laser Technology in front of around 300 guests. This year’s winners of the €10,000 award are Dr. Boris Regaard of TRUMPF Werkzeugmaschinen GmbH + Co. KG (2020) and Stefan Wolf of Primes GmbH. Both were able to impress the high-caliber jury with forward-looking projects. In his laudation, Prof. John Powell from Lulea University of Technology, Sweden, praised the high quality of the projects and the innovative spirit of the award winners. The prizes for 2020 and 2022 were awarded together, as the 2020 award ceremony could not take place due to the restrictions imposed in response to the Corona pandemic.

The Innovation award for laser technology is presented every two years to laser manufacturers and users as well as researchers and developers who have spearheaded a laser technology innovation from application-oriented research to successful industrial implementation. The organisers are the Arbeitskreis Lasertechnik AKL e.V., a network of around 180 laser experts, and the European Laser Institute ELI e.V., a platform that brings together expertise and knowledge of optical technologies.

Dr. Alexander Olowinsky, Chairman of the Board of the European Laser Institute ELI e.V., and Dipl.-Ing. Ulrich Berners, Chairman of the Board of AKL e.V., describe the context of the award: “With the presentation of the Innovation Award for Laser Technology, we want to honor precisely those innovators who have spearheaded an invention in the field of production-oriented laser technology from research through development to market launch.”

The award-winning projects were met with enthusiasm: “Each of the finalist teams has made a significant contribution to the advancement of science and technology through their innovative achievements.”

First prizes

The topic of the 2020 award-winning project was “Active Speed Control – Camera-Based Sensor System for Closed-Loop Feed Regulation in Laser Cutting”. At the heart of Active Speed Control, developed by Dr. Boris Regaard and his team at TRUMPF Werkzeugmaschinen GmbH + Co. KG, Ditzingen, is a camera-based sensor system in the cutting head, whereby real-time image processing analyses the camera data. Based on the data analysis, the feed rate is constantly monitored for optimal results. This ensures maximum cutting speed and a more reliable process. The result optimised productivity and lowers scrap and rework. The system has potential for controlling or monitoring other process parameters and is thus a milestone towards the development of a future, fully autonomous laser cutting machine.

The 2022 award-winning project was called “Scan Field Monitor (SFM)”. It was developed by Stefan Wolf, Head of Research and Development at PRIMES GmbH, Pfungstadt, and his team as a tool for laser scanner characterisation. The development was prompted by many new applications in the field of additive manufacturing and e-mobility. The patented measurement principle enables the measurement of laser beam parameters by scanning vectors. The resulting laser scanner characterisation provides all geometric and laser-related parameters relevant for remote applications. In the same operation, beam position and movement of the laser scanner unit in the scan area are determined. The quality of the SFM’s measurement principle becomes apparent whenever the behavior of a dynamic laser plays a role.

Second prizes

The project which was awarded the second prize in 2020 is used in bomb disposal efforts. The innovation, entitled “New Laser Solution for Defusing Unexploded Ordnance (UXO) by the Use of a Disposable 3D Printed Tool Head,” was developed by Dr. Oliver Meier, managing partner of LASER on demand GmbH, Burgdorf, together with the Laser Zentrum Hannover e.V. and the explosive ordnance disposal service of the Hamburg Fire Department. The new approach involves creating a defined weakening in the

cylindrical section of the bomb casing through a laser notching process, which then reduces pressure and thus the detonation force of the bomb. Subsequently, a controlled low energy input triggers a deflagration that is designed to rupture the shell at the notch and eject the detonator. An essential element of the project is the use of standard optical components at an affordable price. If damage occurs during bomb defusing, which is not unlikely, the components can be easily replaced.

The second prize in 2022 goes to the project “Innovative Surfaces using High-Speed Laser-Biomimetics” by Dr. Tim Kunze, Managing Director of Fusion Bionic GmbH, Dresden, and his team. Functional technical surfaces have so far been produced mainly by coatings and lithographic processes. The potential of these techniques is currently limited, but direct laser interference patterning (DLIP) technology offers entirely new, limitless possibilities for surface enhancement. For example, surfaces can be created to which ice does not adhere (anti-icing, e.g., for aviation), or implants that are better accepted by the body thanks to their biocompatible and antibacterial surfaces. Fusion Bionic has developed high-throughput manufacturing systems based on DLIP that are compact, robust, and up to 10 times faster than established processes. Without additional steps or chemicals, these DLIP modules create micro- and nanotextures on the surface at speeds of up to 1 m²/min.

Third prizes

“Unlimited Flexibility for Short Pulse Laser Applications” is what the neoMOS “SMART” laser system offers. The system, developed by Dr. Maik Frede of neoLASE GmbH in Hannover, Germany, implements the philosophy of developing new applications in laser micromachining through the flexible use of short pulse lasers. The integrated ultrashort pulse laser for material processing enables pulse durations from nano- to femto-seconds or a combination of different pulse durations in the same process. The basis for this is a novel amplifier technology. Combined with a modular MOPA platform, the “open source” philosophy makes it possible to exchange only a part of the laser (seeder) to set up completely new laser parameters. Different seed lasers allow pulse durations, repetition rates or pulse durations to be changed from the same laser system. It is an example of a new generation of machines that combines the functionality of several laser systems in just one machine.



Winners of the Innovation Award for Laser Technology 2020 (f.l.t.r. Kristina zur Mühlen, Prof. Constantin Häfner, Dr. Maik Frede, Dr. Oliver Meier, Dr. Boris Regaard, Dr. Alexander Olowinsky, Ulrich Berners) © Arbeitskreis Lasertechnik e.V./Andreas Steindl.



Winners of the Innovation Award for Laser Technology 2022: (f.l.t.r. Kristina zur Mühlen, Prof. Constantin Häfner, Thibault Bautze-Scherff, Stefan Wolf, Dr. Tim Kunze, Dr. Alexander Olowinsky, Ulrich Berners) © Arbeitskreis Lasertechnik e.V./Andreas Steindl.

Community

EOS News

Preview: EOSAM 2022 in Porto, Portugal

The European Optical Society Annual Meeting, EOSAM, is a major international scientific conference and exhibition in Europe covering all aspects of optics and photonics. It is attended annually by over 500 top researchers, key leaders, students, and industry experts. Each year EOSAM moves into different country celebrating optics hubs around Europe. This year we visit the wonderful Porto, Portugal, 12–16 September 2022.

EOSAM will once again include several topical meetings, poster sessions, tutorials, special sessions for Early Researchers and EU projects, networking events, industrial exhibition, and more. EOSAM includes topical meetings and sessions from a wide range of topics:

- TOM1: Silicon Photonics and Guided-Wave Optics
- TOM2: Computational, Adaptive and Freeform Optics - focus on Illumination, AR/VR, and information driven systems
- TOM3: Optical System Design, Tolerancing, and Manufacturing
- TOM4: Bio-Medical Optics
- TOM5: Resonant Nanophotonics
- TOM6: Optical Materials: crystals, glasses, thin films, nanostructures/nanocrystals, metasurfaces, organic molecules and polymers, synthesis ...
- TOM7: Thermal radiation and energy management
- TOM8: Nonlinear and Quantum Optics
- TOM9: Opto-electronic Nanotechnologies and Complex Systems
- TOM10: Frontiers in Optical Metrology
- TOM11: Tapered Optical Fibers, from fundamentals to applications
- TOM12: Optofluidics
- TOM13: Advances and Applications of Optics and Photonics
- EU Project Session
- Early Stage Researcher Session.

After the conference, a special issue will be published on the topics of the conference, in the online, open-access Journal of the European Optical Society, JEOS:RP.

EOSAM includes several high-level speakers from various fields of optics, among others over 50 invited speakers covering a wide range of topics. This year we have the pleasure to listen to these renowned Plenary Speakers at EOSAM:

- Jacqueline Bloch, Professor at C2N – Centre de Nanosciences et de Nanotechnologies
- Rachel Grange, Professor at ETH Zürich
- Joseph Howard, Optical Engineer at NASA Goddard Space Flight Center
- Hervé C. Lefèvre, Chief Science Officer at iXblue Photonics
- Juan C Miñano, Professor at LIMBAK & Universidad Politécnica de Madrid
- Nuno Peres, Professor at Universidade do Minho
- Arno Rauschenbeutel, Professor at Department of Physics, Humboldt University of Berlin
- Silvia Vignolini, Professor at University of Cambridge

For the list of all invited speakers, visit the Topical meeting (TOM) sites at www.eosam2022.org to learn more.

Networking available even before the conference

The intriguing scientific program is coupled with the two-day industrial exhibition 14–15 September at the heart of the conference venue. EOSAM was established specifically to provide a platform for experts in the field of optics and photonics, bringing forth new research results, the state of the art, and bridging the gap between research, education, and industry.

This is the perfect opportunity to connect, catch up and network alongside the intriguing conference program! To reinforce the networking opportunities, all social programs and breaks with magnificent local delicacies are included in the registration fee; lunches, coffees, welcome reception, conference dinner, etc.

EOSAM makes connecting easy, and one can be in touch with colleagues even before touching ground at

Porto as EOSAM attendees have an opportunity to connect with others even BEFORE the conference. By registering for the event, attendees will gain access to the list of participants with their contact information, LinkedIn profiles etc. All attendees themselves choose how much information they wish to share with other attendees. Quick messages between attendees enable efficient communication and preparation for onsite meet-ups.

Registration for the conference is open. Early bird prices are available until 30 June.

We are looking forward to welcoming you in Porto, Portugal 12–16 September 2022!

On behalf of the whole EOSAM team,
Elina Koistinen
EOS Executive Director
www.eosam2022.org



EOSAM was one of the few conferences which had a chance for on-site meetings in 2021. It was held at the University La Sapienza in Rome, Italy. (Photo: EOS).

Community

Conference calendar

The calendar has been reviewed carefully. Due to further regulations in response to the worldwide pandemic, dates or locations may vary from this list.

Nevertheless, the pandemic may offer new opportunities as well. Please visit the website of a conference you missed. Some offer on-demand viewing of the meeting.

2022 June

123. Jahrestagung DGaO
Pforzheim, Germany
7–11 June 2022
www.dgao.de

LASYS

Stuttgart, Germany
21–23 June 2022
www.messe-stuttgart.de/lasys/

2022 Siegman International School on Lasers

Warsaw, Poland
25 June – 02 July 2022
www.optica.org/en-us/events/topical_meetings/siegman_international_school_on_lasers/

July

SPIE Astronomical Telescopes + Instrumentation

Montreal, Quebec, Canada
17–22 July 2022
<https://spie.org/x138581.xml>

Imaging and Applied Optics Congress

Vancouver, BC, Canada
11–15 July 2022
www.optica.org/en-us/events/congress/imaging_and_applied_optics_congress/

International Conference on Ultrafast Phenomena

Montreal, Quebec, Canada
18–22 July 2022

www.optica.org/en-us/events/topical_meetings/ultrafast_phenomena

August

SPIE Optics + Photonics

San Diego, CA, USA
21–25 August 2022
www.spie.org/Op

September

SPIE Sensors + Imaging

Berlin, Germany
5–8 September 2022
www.spie.org/si

ICO-25 and OWLS-16

Dresden, Germany
5–9 September 2022
<https://www.ico25.org/>

European Conference on Optical Communication ECOC

Basel, Switzerland
18–22 September 2022
www.optica.org/en-us/events/topical_meetings/ecoc/

October

Frontiers in Optics + Laser Science

Rochester, New York, United States
16–20 October 2022
www.optica.org/en-us/events/global_calendar/events/frontiers_in_optics_the_105th_osa_annual_meeting_a/

2023 January

SPIE Photonics West

San Francisco, CA, USA
28 January – 2 February 2023
www.spie.org/dcs

March

OFC

San Diego, CA, USA

5–9 March 2023

www.optica.org/en-us/events/global_calendar/events/optical_fiber_communications_conference_2023/

April

SPIE Defense + Commercial Sensing

Orlando, FL, USA

30 April–4 May 2023

www.spie.org/dcs

Biophotonics Congress: Optics in the Life Sciences OWLS 2023

Vancouver, British Columbia, Canada

24–27 April 2023

www.optica.org/en-us/events/congress/biophotonics_congress/

UKP Workshop

Aachen, Germany

26–27 April 2023

www-ultrakurzpulslaser.de

May

CLEO 2023

San Jose, CA, USA

7–12 May 2023

<http://www.cleoconference.org>

June

LASER World of Photonics

Munich, Germany

27–30 June 2023

www.laser.de

World of Photonics Congress

Munich, Germany

www.photonics-congress.com/en/

SPIE Conferences @WoP Congress

Biomedical Optics

Digital Optical Technologies

Optical Metrology

Munich, Germany

25–30 June 2023

<https://spie.org/conferences-and-exhibitions>