

PRESS RELEASE

PRESS RELEASE

No. 09 | 2023

June 21, 2023 || Page 1 | 9

Focus on Added Industrial Value through Light

Combined Conference Laser Symposium and ISAM Unites Science and Industry in Dresden at the End of November

(Dresden, 06/21/2023) Light embodies far more than just color and brightness. Strongly focused, the light may serve as a powerful tool. Technically, this capability has been exploited for over 60 years with the help of lasers, which are now available in a wide variety of power classes ranging from a few milliwatts to well over 40 kilowatts. In high-precision metrology, as a non-contact, wear-free tool for cutting, joining, coating, surface structuring and heat treatment, and for Additive Manufacturing: The combined Laser Symposium and International Symposium on Additive Manufacturing (ISAM) conference in Dresden from November 29 to December 1, 2023, will show how lasers contribute significantly to added industrial value today and in the future. Artificial intelligence is helping to further push the boundaries of laser-based processes.

When Theodore Maiman completed the first laser in May 1960, he could not have imagined the triumphant progress this effect based on "Light Amplification by Stimulated Emission of Radiation" (LASER for short) would take. Today, it is impossible to imagine our world without the laser. As a laser pointer, it generates a well-focused intense beam of light; in medicine, it helps with eye operations; and in industrial production, it enables the processing of almost all materials as well as the manufacture of components using the least amount of material. The almost inexhaustible range of applications of currently available and new laser sources confirms the important role of lasers in adding value to industry and lays the foundation for new laser applications.

The Laser World focuses on Dresden in November

Specialist experts from all over the world will report on the latest developments, prospects and applications of laser technology, including Additive Manufacturing, at the combined Laser Symposium and ISAM 2023 conference. From the end of November to the beginning of December, their focus at the Deutsches Hygiene-Museum in Dresden will be on the use of lasers in industrial production and increasing value creation. The organizer of the industry meeting for laser users is Fraunhofer IWS, which supports customers and partners from industry and science with decades of

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experience as an innovation driver and ensures the transfer of laboratory-scale research results to industrial applications.

PRESS RELEASE

No. 09 | 2023

June 21, 2023 || Page 2 | 9

Inventive Spirit as a Driver for Sound Laser Research

Building on successful industrial implementations in the past, Fraunhofer IWS researchers are currently working, for example, on solutions for the energy transition, in which several laser processes are integrated into one process chain. "Using a roll-to-roll process, we want to revolutionize the production of bipolar plates for fuel cells," emphasizes Prof. Christoph Leyens, director of the Dresden Institute. "We have expressed the goal of producing ready-to-use bipolar plates within one second in a continuous process. This is only possible by means of fast, flexible, and highly accurate process steps. Laser-based joining and cutting provide important contributions to productivity for this purpose." The Dresden researchers are also demonstrating a great deal of inventiveness in the application-oriented further development of dynamic beam shaping in welding and cutting. Precisely applied energy is capable of significantly improving the quality of weld seams and cut edges. This capability also provides the basis for a robust industrial process in laser hardening. With the help of a thermal field controller developed at Fraunhofer IWS, the hardening result can reach a uniform quality even for complex component geometries. "All of our laser processes increasingly generate large amounts of data that we want to record and process online for quality control downstream or for process monitoring and control. This requires data separation and its fast processing," explains Leyens. "We are therefore applying artificial intelligence methods to make the best possible use of the potential inherent in our data treasure trove."

Laser Ensures Products Suitable for Industrial Use with Additive Manufacturing

Lasers are also used in Additive Manufacturing as an energy source for industrial-grade products: both for the production of filigree structures and for large-volume components. ISAM 2023 will showcase the latest research and development results for products that can be manufactured with high quality and reliability only thanks to close-knit process control. "Whether in powder bed or powder and wire die-based processes: Reliable information about the current state of hardware components and the prevailing process conditions currently still pose major challenges. However, they also offer a huge opportunity to take additive manufacturing processes to the next level," estimates Prof. Frank Brückner, Technology Area Manager Additive Manufacturing and Surface Technology at Fraunhofer IWS. At the ISAM 2023 conference, exciting contributions from different industries such as medical engineering, aerospace, energy technology, and mechanical engineering will be presented. For example, biomimetic approaches enable the transfer of nature-inspired

Materials and Lasers – Competence with a System: The **Fraunhofer Institute for Material and Beam Technology IWS** develops complex system solutions in materials and laser technology. We define ourselves as idea drivers developing customized solutions based on laser applications, functionalized surfaces as well as material and process innovations – from easy-to-integrate custom solutions to cost-efficient solutions for small and medium-sized enterprises to industry-ready one-stop solutions. Our research focuses on aerospace, energy and environmental technology, automotive, medical and mechanical engineering, toolmaking, electrical engineering and microelectronics, and photonics and optics sectors. In our five future and innovation fields of battery technology, hydrogen technology, surface functionalization, photonic production systems and additive manufacturing, we are already creating the basis today for the technological answers of tomorrow.

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functionalities into technical applications. Diversified process chains allow the adaptation to economic, agile, and resilient production capacities. The combined Laser Symposium and ISAM 2023 conference will offer a broadly diversified international audience a cutting-edge selection of topics in Additive Manufacturing in the context of decarbonization, novel material concepts, process qualification, and digitalization along the entire process chain, and a variety of other topics.

PRESS RELEASE

No. 09 | 2023

 June 21, 2023 || Page 3 | 9

Program Overview

Thursday November 30, 2023		Friday December 1, 2023	
Laser Symposium	ISAM	Laser Symposium	ISAM
Opening Plenary »Emerging Technologies«		Joint Plenary »New Frontiers in Material Processing«	
Aussteller-Pitches		Exhibitor-Pitches	
»Advanced Laser Sources«	»Design and Simulation«	»Beam Shaping«	»Digitalization«
»Laser Welding«	»Trends in AM«	»Micro Processing«	»Surface Treatment in AM«
»Laser Cutting«	»Materials«	»Cladding and Thermal Coating«	»Business Cases and Industrialization«
Poster Session		Closing Plenary	
»Process Monitoring and Control«	»Future Technologies and Processing«		
Networking Session			

Open Lab @Fraunhofer IWS

On the eve of the joint conference Laser Symposium and ISAM, the organizing institute opens its doors to the "Open Lab @Fraunhofer IWS". On November 29, the scientists of Fraunhofer IWS will provide deep insights into their latest research activities. During individual tours through the labs, the conference attendees will experience live demonstrations on latest laser, material, and system technology. The Open Lab is a place to discuss current issues with the institute's specialists and to gain personal impressions of the work at Fraunhofer IWS.

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Infobox

Location: Deutsches Hygiene-Museum Dresden



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Opened in 1930, the museum building is an important architectural monument of the New Objectivity and offers conference facilities for up to 1,500 attendees. Just a stone's throw from the Frauenkirche, the Deutsches Hygiene-Museum invites visitors to experience the human being and its body. For over 100 years, it has provided a unique view "under the skin": How does our body work? When does life begin? Why do we age? What is the human being? Under one roof, the museum combines the permanent exhibition "Adventure Man" and the children's museum "World of the Senses" as well as annually changing exhibitions and events on current topics from science, culture, and society.

More information: <https://s.fhg.de/ls-am-venue>

PRESS RELEASE

No. 09 | 2023

June 21, 2023 || Page 4 | 9

Infobox

Dresden in Pre-Christmas Season



© Sebastian Weingart

Dresden offers ideal conditions for an international conference. The capital of Saxony combines a historic past with technological progress to create a unique setting.

The timing in early December allows conference participants to seamlessly combine science, culture, and the magic of the Christmas season in an extraordinary setting. The city awakens to life with festive markets, enchanting decorations, and Christmas sounds. During a stroll through the Striezelmarkt, one of Germany's oldest Christmas markets, participants will enjoy traditional specialties like stollen and mulled wine or browse for handmade souvenirs. Other sights such as the historic city center, the Frauenkirche church, or the Zwinger with its world-class art collections round off the stay in Dresden, along with many other attractions.

More information: <https://s.fhg.de/l5-am-venue>

PRESS RELEASE

No. 09 | 2023

June 21, 2023 || Page 5 | 9

About Laser Symposium and ISAM

The combination of Laser Symposium and ISAM in a joint conference provides a unique platform for the exchange of ideas and networking of science with industry.

Laser Symposium brings together the world's leading laser experts, end users, and newcomers from industry and academia. Focusing on the latest laser developments and their suitability for industrial applications, it provides an ideal platform for scientific and technical exchange on various aspects of laser material processing.

The International Symposium on Additive Manufacturing (ISAM) highlights the latest developments and challenges in additive manufacturing as it becomes increasingly important for industrial applications. Fascinating technical solutions paired with exciting economic benefits act as powerful drivers for global research and development.

More information: <https://www.lasersymposium.de/>

PRESS RELEASE

No. 09 | 2023

June 21, 2023 || Page 6 | 9



PRESS RELEASE

No. 09 | 2023

June 21, 2023 || Page 7 | 9

The combined **Laser Symposium and International Symposium on Additive Manufacturing (ISAM) 2023** conference in Dresden, Germany, will showcase from November 29 to December 1, 2023, how lasers contribute significantly to industrial value creation today and in the future.

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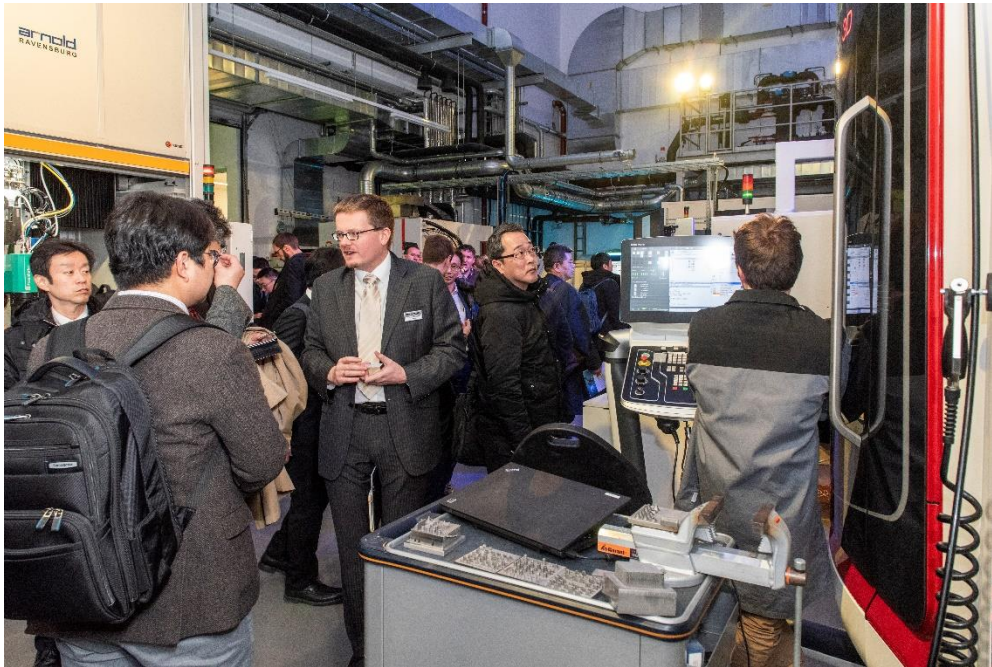
No. 09 | 2023

June 21, 2023 || Page 8 | 9

Representatives from industry and academia will once more gain insights into the latest developments and perspectives in laser technology, its applications, and in Additive Manufacturing from domain experts from around the world, as seen here during the ISAM 2019 conference.

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PRESS RELEASE

No. 09 | 2023

June 21, 2023 || Page 9 | 9

On the eve of the combined conference, Fraunhofer IWS will open its doors for the “Open Lab @Fraunhofer IWS”.

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