

Press release

Aachen, April 18, 2024

Innovations from laser technology for the industry

Presentation of the Innovation Award Laser Technology 2024 in Aachen

The winner of the €10,000 Innovation Award Laser Technology 2024 is Mr. Edwin Büchter, co-founder, mentor and managing director of cleansort GmbH in Rösrath, Germany. The award was presented by the associations Arbeitskreis Lasertechnik e.V. and the European Laser Institute ELI e.V. on April 17, 2024 in the Coronation Hall of Aachen's Town Hall. Mr. Edwin Büchter and his team took the first place in the open competition with the innovation "Laser-based sorting system for resource-saving recycling of recyclable materials". The ten-member international jury selected three outstanding finalists from the numerous applications received. Around 350 guests attended the award ceremony in an historic setting.

In his inspiring keynote speech, Dr. Peter Leibinger, Chairman of the Supervisory Board of Leibinger SE, focused on the fascination and limitless possibilities of laser technology, but above all on the innovative strength of German photonics research and industry. His speech was a successful introduction to the upcoming award ceremony and created an exciting and expectant atmosphere. The award ceremony itself was hosted by journalist, television presenter and graduate physicist Kristina zur Mühlen, who led the evening with her eloquent presence and charming manner.

The **Innovation Award Laser Technology** is presented every two years to laser manufacturers and users as well as researchers and developers who have successfully brought a laser technology innovation from application-oriented research to industrial implementation. The award is presented by the Arbeitskreis Lasertechnik AKL e.V., a network of around 200 laser experts, and the European Laser Institute ELI e.V., a platform that pools expertise and knowledge about optical technologies.

These are the 2024 Prize winners and their projects:

1st place:

„Laser-based sorting systems for resource-saving recycling of recyclable materials“

Team:

Edwin Büchter, cleansort GmbH, Rösrath, Germany

Philipp Soest, cleansort GmbH, Rösrath, Germany

Dr. Winfried Barkhausen, cleansort GmbH, Rösrath, Germany

Josef Tholen, Clean-Lasersysteme GmbH, Herzogenrath, Germany

The topic of the 2024 award-winning project is the efficient cleaning, analysis and sorting of surface-contaminated metal scrap in a single step. The combination of laser ablation and laser spectroscopy allows the alloy content to be determined quickly and precisely. The intelligent software enables modular cascading of the technology for a wide range of industrial applications. With a success rate of over 93% and a process that runs in just six milliseconds, the method not only saves resources but is also extremely economical.

The cleansort process increases resource efficiency and reduces material and energy costs as well as greenhouse gas emissions. Aluminum in particular offers a high savings potential. Compared to primary production, around 95% energy can be saved. A single Cleansort unit can save up to

291,000 MWh of electrical energy and over 126,000 tons of CO₂ per year, which corresponds to almost the entire private energy consumption of all the inhabitants of the city of Aachen.

The process has potential applications in various sectors, from the automotive industry to the aviation industry and waste incineration plants. It enables the recycling of all types of metals without sorting or losses and is therefore an important step towards a sustainable circular economy.

2nd place:

„Holistic approach to laser beam welding for cell contacting of battery modules with the highest quality“

Team:

Dr. Jan-Philipp Weberpals, AUDI AG, Neckarsulm, Germany

Daniel Böhm, AUDI AG, Ingolstadt, Germany

Dr. Jens Reiser, Precitec GmbH & Co. KG, Gaggenau, Germany

Martin Krause, Precitec GmbH & Co. KG, Gaggenau, Germany

Timur Demirbas, former Precitec GmbH & Co. KG, Gaggenau, Germany

The project, which was awarded second prize in 2024, is currently being used in prototype production at Audi and is on its step into serial production. The automotive industry is responding to global warming by switching from combustion engines to electrically powered vehicles. A key challenge here is quality assurance in battery production. Audi has developed an innovative solution with the integrated laser remote welding process. The process not only ensures the electrical conductivity of every weld seam, but also enables emission-free production and thus supports the environmental goals of AUDI AG and the VW Group, which are aiming for CO₂-neutral production by 2035.

The advanced technology offers numerous advantages, including the compensation of tolerances and optimum positioning of the weld seams to protect the battery cells from damage. Beam oscillation and high-speed welding produce weld seams of the highest quality and reduce process time. The AI-based evaluation of the process signals minimizes the quality control loop to batch size "1" so that defects can be detected instantly and rectified immediately by reworking. The technology not only contributes to quality assurance and cost savings, but also plays an important role in reducing the environmental footprint of battery production.

3rd place:

„CANUNDA - Upscaling laser processing with beam-shaping“

Team:

Gwenn Pallier, Cailabs, Rennes, France

Dr. Adeline Orioux, Cailabs, Rennes, France

Dr. Ivan Gusachenko, Cailabs, Rennes, France

Thibaut Atché, Cailabs, Rennes, France

The third place in 2024 goes to the company Cailabs. The nominated project is the commercialization of Multi-Plane Light Conversion (MPLC) for high-performance laser material processing. This unique beam shaping technology was developed at the Laboratoire Kastler Brossel in Paris, France, for use in telecommunications and optical space-to-earth communication. Since 2018, MPLC has been successfully used in laser material processing under the name CANUNDA. The technology modifies the intensity distribution of the processing laser in order to achieve higher process speeds and improved quality in many laser processes. This innovation addresses specific challenges such as

porosity and spatter when welding copper and aluminum, materials that are particularly important for electromobility.

CANUNDA solutions offer robust, compatible and customized beam shaping for the industry. Existing customers have already benefited from technology leadership, increased production capacity, improved machine profitability and the development of new machine (concepts). CANUNDA's MPLC technology enables complex beam shapes that contribute to more efficient and higher quality laser processing applications.

Jury

The 2024 jury consisted of Dr. Lutz Aschke (Photonics System Group, Krailing, D), Dr. Pavel Bakule (ELI Beamlines Facility, Dolní Břežany, CZE), Dr. Guido Bonati (FISBA AG, St. Gallen, CH), Dr. Stefan Hengesbach (QuiX Quantum, Enschede, NL), Dr. Willem Hoving (Photonics Consultancy, Geldrop, NL), Dr. Alexander Knitsch (TRUMPF Laser- und Systemtechnik GmbH, Ditzingen, D), Eric Mottay (h-nu, Begles, F), Prof. Juan M. Pou Saracho (Universidade de Vigo, Vigo, ES), Dr. José Antonio Ramos de Campos (LASEA, Seraing, BEL) and Pablo M. Romero (AIMEN, O Porriño, ES). Dr. Markus Kogel-Hollacher (Arbeitskreis Lasertechnik e.V.) and Prof. Dr. Stefan Kaierle (European Laser Institute e.V.) were responsible for the organization.

Selection process and finalists

An international jury of personalities from industry and research compiles a shortlist of the best candidates. The award winner and the runners-up are then selected by the jury as outstanding finalists on the basis of their achievements and the published criteria. The winner receives prize money of €10,000 and is awarded the title of "AKL Fellow" and "ELI Fellow".



1st Place

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2nd Place

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3rd Place

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Team Representatives

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Further information:

- **to the Innovation Award and the finalists:** www.innovation-award-laser.org
Here you can also download photos of the award ceremony on April 17, 2024 in Aachen Town Hall as well as detailed descriptions of the finalists' innovations.
- **to the Arbeitskreis Lasertechnik AKL e.V.:** www.akl-ev.de
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- **to the International Laser Technology Congress AKL'24 (April 17-19, 2024):**
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