

Dynamic progress of laser technology

New fields of applications and fresh inspiration

On the occasion of the Stuttgart Laser Technology Forum (SLT) 2022, we already highlighted the huge potential that has arisen from the fast progress in the development of flexible lasers, which will soon offer the ability to switch between cw and (ultrashort) pulsed operation at kilowatt average power levels. The prospect of performing virtually all laser-based manufacturing processes with the same laser on one and the same machine bodes well for digital manufacturing and promises fresh inspiration in the corresponding research.

The vision of a universal laser machine is being strongly promoted by the Institut für Strahlwerkzeuge (IFSW) at the University of Stuttgart and is successfully pursued thanks to the new professorship on laser technology in manufacturing that has been created. Our established research competencies, which are currently dedicated to making high-power laser systems more versatile as well as improving our understanding of the processing fundamentals, are rapidly being expanded to include the use of artificial intelligence and the application of laser-based processes for the manufacture of quantum technology components.

With this in mind, the plenary keynotes of the SLT 2024 are devoted to the role of photonics in quantum technology and its industrialization, novel lasers with exciting capabilities, and the exploitation of artificial intelligence, for example in manufacturing. So together with many other exciting contributions, the SLT 2024 will once again provide an outlook into the dynamically developing future of laser technology and will highlight the current trends and achievements. The latest laser system developments will be discussed along with the latest advances in beam shaping and beam delivery. With regard to materials processing, the applications to be presented range from high-precision ablation to additive manufacturing, and include sessions on process monitoring and the potential of laser processing for quantum technology.

We wish you inspiring reading of this issue of PhotonicsViews!

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