

PRESS RELEASE

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Highlights 2019: Fraunhofer IOF at the LASER World of PHOTONICS

Additive manufacturing, quantum technologies, active optics for space applications – once again, the Fraunhofer Institute for Applied Optics and Precision Engineering IOF presents the latest cutting-edge technologies in optics and photonics research at this year's LASER World of PHOTONICS in Munich. From June 24 - 27, 2019, experts will be present at the joint Fraunhofer booth (Hall B3, booth 335) to answer questions and showcase »Photonics – Made in Jena«.

A pioneer in optics and photonics research, the Fraunhofer Institute for Applied Optics and Precision Engineering IOF in Jena has been working on the development of innovative optical components and systems for more than 25 years. Among other topics, research focuses on freeform technologies, micro- and nanotech technologies, fiber laser systems, quantum optics, and optical technologies for safe human-machine interaction. Once again, the institute presents a multitude of new applications at the LASER World of PHOTONICS in Munich this year.

These are the core topics of Fraunhofer IOF at LASER 2019:

Additive Manufacturing of light weight mirrors and systems

Telescopes for space applications are based on precise, mass-reduced and stable arrangements of several mirrors. Additive manufacturing processes offer new concepts for the production of metal optics that can overcome the specific limitations of conventional manufacturing technologies. Fraunhofer IOF presents a lightweight mirror system manufactured in such way, whose internal and external housing structures have been produced by selective laser melting (SLM) of aluminium-silicon material. The mass reduction of a single mirror component reaches up to 64%, using an internal structure which is not manufacturable by conventional techniques.

Optical Quantum Technologies

The Fraunhofer IOF is a pioneer in applied research on photonic quantum technologies. For the first time, developments in the field of quantum imaging will be presented at this year's LASER World of PHOTONICS. It is a quantum photonically based imaging system. By using high-power sources of entangled photons, such as those developed at the Fraunhofer IOF, future imaging systems based on quantum technologies can become even more compact, e.g. for applications in biology and medical technology.

Editorial Notes

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Fast adaptive focusing mirrors for materials processing

The fast adaptation of the laser focus in materials processing requires adaptive optics with fast response times. In order to enable the user to easily integrate and upgrade existing systems, Fraunhofer IOF presents a focusing mirror that is designed as a 90° deflecting mirror and achieves a reaction time of a few milliseconds. On display will be a version for laser cutting and laser welding, as well as a further version with integrated plane field correction for applications in laser structuring systems. The technology was developed within the BMBF project »Piezo-driven beam shaping for highly dynamic laser materials processing in 3D space«, which is part of the smart³ innovation network.

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-----**Events and presentations (selection):****Public Workshop: fo+ »freeform optics plus«**

FORUM Hall B3: Laser and Optics

25. Juni 2019 | 13:20 – 14:40

Chairmen: Lutz Reichmann (JENOPTIK Optical Systems GmbH), Dr. Andreas Beutler (Mahr GmbH), Sven Kiontke (asphericon GmbH), Prof. Herbert Gross (Friedrich-Schiller-Universität Jena)

Industry Panel: Diode-pumped solid-state lasers and fiber lasers

FORUM Hall B3: Laser and Optics

24. Juni 2019 | 15:00 – 17:20

Chairmen: Frank Gäbler, Coherent (ROFIN), Hans-Dieter Hoffmann (Fraunhofer ILT), Prof. Dr. Andreas Tünnermann (Fraunhofer IOF)

Images

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Figure 1: Additively manufactured lightweight mirror made of AlSi alloy after final polishing step. © Fraunhofer IOF

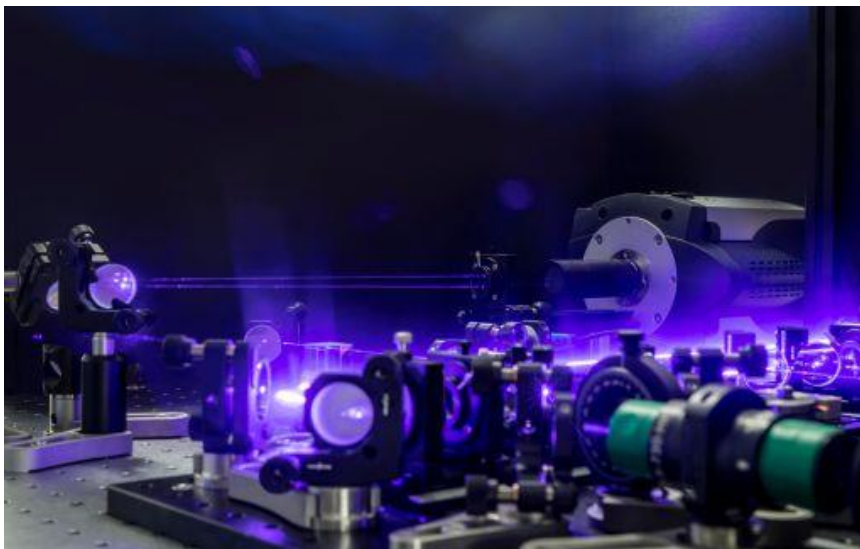


Figure 2: Quantum Optical Imaging System – A robust monocrystal setup enables the examination of an object in the ultraviolet (UV) or infrared (IR) spectral range.
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Figure 3: Adaptive focusing mirrors with ultra-short reaction times. Left: Version with integrated plane field correction for applications in laser structuring systems. Right: Version for laser cutting/laser welding. © Fraunhofer IOF