Thursday, October 19, 2023

This Week in PHOTONICS

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.: Top Stories

Femtosecond Laser Integrates Optics in Single Glass Substrate for Easy Manufacture

The short, regular pulses of femtosecond lasers are put to effective use in numerous applications, including laser surgery, micromachining, microscopy, and spectroscopy. Free-space optics offers substantial freedom in femtosecond laser design — but this comes at the cost of limited miniaturization and manufacturability. A new approach, developed at École Polytechnique Fédérale de Lausanne (EPFL), makes the free-space optical components of a femtosecond laser easier to align, thus making the laser easier to manufacture.

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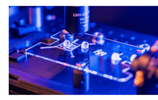

Birefringent All-Glass Metasurface Could Transform Waveplate Tech

Lawrence Livermore National Laboratory researchers have adapted their novel metasurface process, which creates a thin layer on the surface of an optic, to create an all-glass metasurface with birefringence, or dual refraction, properties. This achievement could transform waveplate technology for high-power laser systems such as the National Ignition Facility.

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Deep Learning Delivers High-Quality Optoacoustic Images in Real Time

High-quality medical imaging from multispectral optoacoustic tomography (MSOT) could be used to diagnose and evaluate a range of diseases, including breast cancer, Duchenne muscular dystrophy, inflammatory bowel disease, and many more. However, the length of time currently required for MSOT to process high-quality images makes it impractical in clinical settings. To provide high-quality, real-time optoacoustic imaging via MSOT, researchers from the Bioengineering Center and the Computational Health Center at Helmholtz Munich and the Technical University of Munich developed DeepMB, a deep-learning framework. DeepMB expresses model-based reconstruction with a deep neural network.

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Photonics Media

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Quasi-Rugate thin film designs are optimized for high-power laser applications for ultra-fast through CW applications across the wavelength range of 355 nm to 2200 nm. Each design has a unique refractive index profile specifically tuned to give optimal performance for our customer's applications. Quasi-Rugate design structures have the highest demonstrated Laser Damage Thresholds of any Ion Beam Sputtered films.

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.: Upcoming Webinars

A Behind-the-Scenes Look at Creating Quality Parts Using Laser Welding

Tue, Oct 31, 2023 10:00 AM - 11:00 AM EDT

To create successful welds, many parameters must be kept within specifications, including laser power at the workpiece, beam quality, focal plane, hitting the seam, cleanliness of parts, gap between parts, welding speed, and machine accuracy. Some parameters need to be checked pre-processing to avoid scrap. Others should be measured during the process to avoid failures. In this webinar, Ophir and Lessmüller join forces to offer a full picture of the measurements needed during the laser welding process. Presented by Ophir and Lessmüller Lasertechnik.

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Advancing Quantum and Nano-Photonics with Machine Learning

Wed, Nov 1, 2023 1:00 PM - 2:00 PM EDT

The discovery of unconventional optical designs via machine learning promises to advance on-chip circuitry, imaging, sensing, energy, and quantum information technology. In this talk, Alexandra Boltasseva of Purdue University discusses photonic design approaches and emerging material platforms for showcasing machine learning-assisted topology optimization for optical metasurface designs with applications in thermophotovoltaics, reflective optics, quantum photonic circuitry, and lightsail technology. She demonstrates the effectiveness of autoencoders for compressing the vast design space of metasurfaces into a smaller search space.

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