

BIOPHOTONICS

BRINGING LIGHT TO THE LIFE SCIENCES®



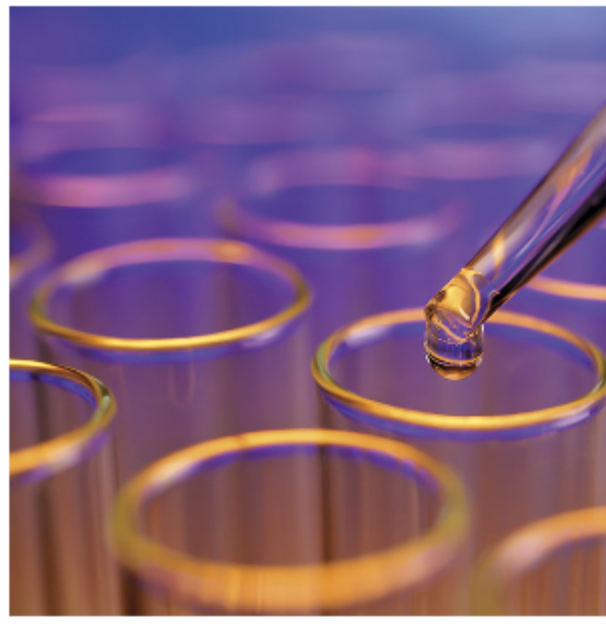
Monthly newsletter focusing on how light-based technologies are being used in the life sciences. Includes news, features and product developments in lasers, imaging, optics, spectroscopy, microscopy, lighting and more. Manage your Photonics Media membership at [Photonics.com/subscribe](https://www.photonics.com/subscribe).



Spectroscopic Tools Facilitate Bedside Diagnosis

Numerous research studies over the past two decades have attested to the promise that spectroscopy holds for diagnosing disease and for guiding therapy in real time. Yet, despite the remarkable advancements that have been made in photonic technology since the turn of the century, novel clinical applications of spectroscopy have lagged due to a lack of research-grade devices that can function in clinical settings such as the emergency department. There is also a lack of reference-quality databases of normal and abnormal variants, as are readily available for histology and radiography.

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Camera Optimization Helps to Clarify In Vivo Diagnosis and Plan Treatment

Pre-clinical in vivo studies are essential to our understanding of human disease, as well as to the development and administration of new treatments and therapeutic agents. Noninvasive, pre-clinical, in vivo imaging techniques allow for long-term studies of treatments. To that end, advanced optical imaging, made available by modern camera technology, can be used to deliver fast, accurate, real-time quantitative measurements.

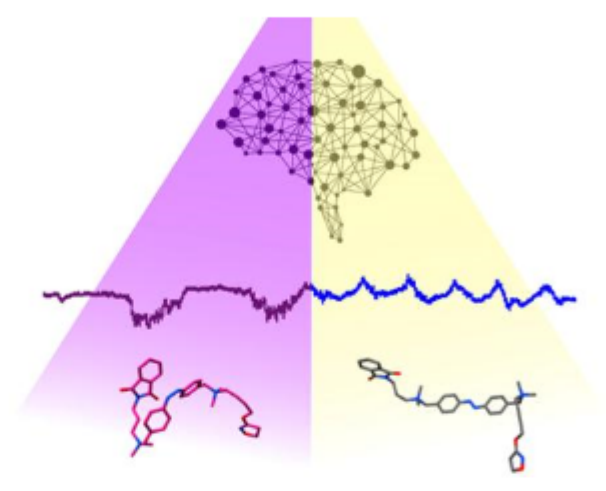
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Researchers Control Brain States Via Photoswitchable Molecule

A team of scientists in Spain has directly photomodulated brain-state transitions in vivo using a photoswitchable molecule that was developed previously by researchers at the Institute for Bioengineering of Catalonia. By applying a light-responsive molecule called phthalimide-azo-iper to the intact brain and subsequently to white light, the researchers were able to modulate slow oscillations in neuronal circuits and reversibly manipulate the oscillatory frequency of the brain.

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Featured Products



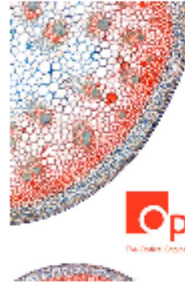
Optical Beam Combining System

Sutter Instrument Company

The Lambda 721 was designed to keep the size of the beam combiner small and the optical path short and efficient. Thin-film bandpass filters, such as Semrock's STR, reflect greater than 90% of out-of-band light.

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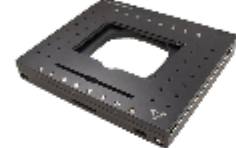
From Concept to Volume Production — You Can do it all with Optikos

Optikos Corporation

Medical Devices and Diagnostics From Concept to Volume Production—You Can Do It All With Optikos.

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RM-1250 GEN II STAGE

Applied Scientific Instrumentation Inc.

The RM-1250 XY stage is the culmination of designing and manufacturing automated XY stages for demanding customers. A flat top, flat bottom, and multiple mounting configurations make it easy for laboratories and manufacturers to integrate it into existing systems. No detail went unexamined in the design of the RM-1250 Gen II.

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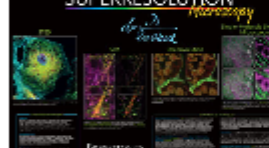


TracePro Optics and Illumination Software

Lambda Research Corp.
TracePro combines a graphical user interface with solid modeling, Monte Carlo ray tracing, analysis features, CAD import/export, optimization methods, and a complete and robust macro language to solve a wide variety of problems in illumination design and optical analysis.

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Superresolution Microscopy Poster

Photonics Media

With interest in the superresolution microscopy field growing rapidly, the editors of BioPhotonics magazine — in collaboration with acknowledged experts — created a poster with readers in mind that is suitable for lab, classroom and office.

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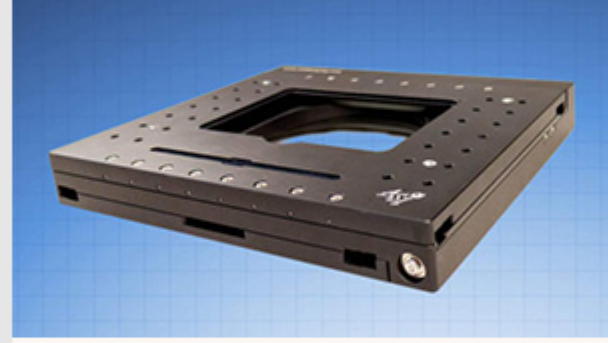
Lumencor's New CELESTA quattro

Lumencor Inc.

The CELESTA quattro Light Engine delivers four lasers with brightness, stability, and longevity. It's designed to provide high performance solid-state laser lighting with which our CELESTA is synonymous, yet it has been refined from seven to four outputs for enhanced value.

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RM-1250 Automated XY Stage
• 125 mm x 125 mm travel
• Single connector for both axes
• Flat top, flat bottom

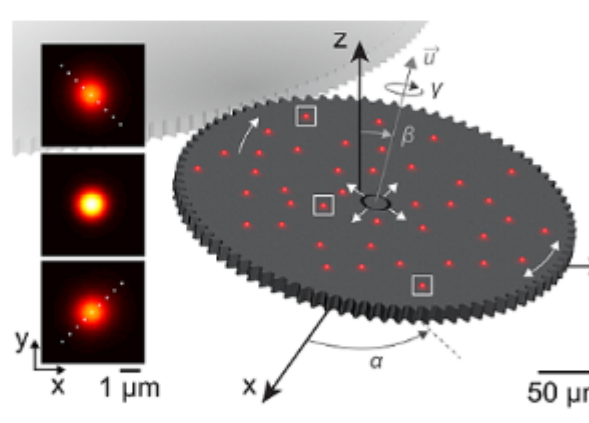


In Case You Missed It

Microscopy Method Accurately Measures in 3 Dimensions

Researchers have devised a calibration method that enables conventional microscopes to accurately measure the positions of points of light on a sample in all three dimensions. The researchers took a problem that affects nearly all optical microscopes — lens aberrations — and used the effects of aberrations to allow precise and accurate tracking of single emitters in 3D throughout an ultrawide and deep field.

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Wearable Sensor Measures Light Emission on Skin to Monitor Tissue Oxygenation

Researchers have combined an oxygen-sensing film and machine learning to create a wearable sensor capable of measuring tissue oxygenation through a person's skin. Developed by researchers at the Wellman Center for Photomedicine at Massachusetts General Hospital and Harvard Medical School, the sensor works by detecting the phosphorescence lifetime and intensity of the acrylic oxygen-sensing film that adheres to the skin.

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Photoacoustic Device Modulates Single Neurons with High Spatiotemporal Resolution

An instrument developed at Boston University (BU) could advance fundamental knowledge in the field of neuroscience and lead to treatments for neurological diseases. The tapered fiber optoacoustic emitter uses the optoacoustic effect to enable neuromodulation with single-cell precision. It provides high spatial resolution for ultrasound stimulation, generating an ultrasound field with a spatial precision of 39.6 μm. It also enables optoacoustic activation of single neurons and subcellular structures.

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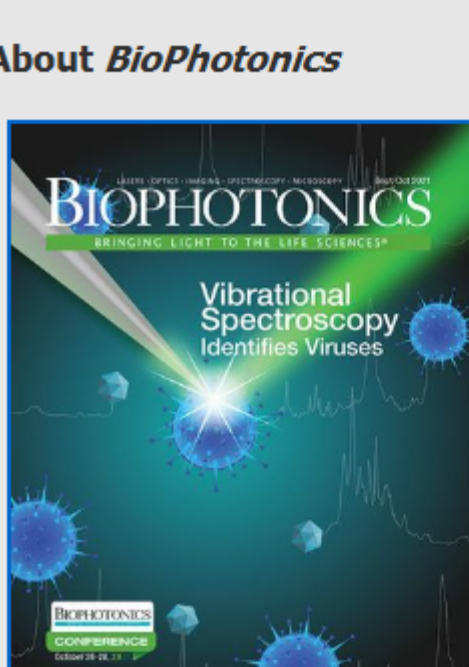
Next Issue:

Features

NIR Spectroscopy and Stroke, Lasers and Epilepsy Treatment, FLIM and Glioblastoma, and more.

Photonics Media is currently seeking technical feature articles on a variety of topics for publication in our magazine *BioPhotonics*. Please submit an informal 100-word abstract to Senior Editor Doug Farmer at Doug.Farmer@Photonics.com, or use our online submission form www.photonics.com/submitfeature.aspx.

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