

BIOPHOTONICS

BRINGING LIGHT TO THE LIFE SCIENCES®

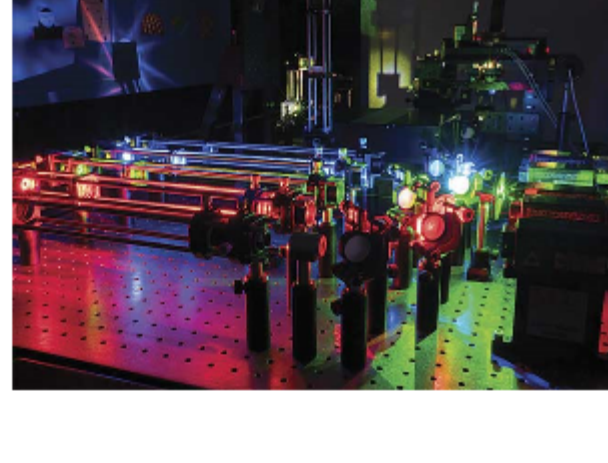
www.BioPhotonics.com

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).



Precision Positioning Aids Microscopes with Tracking Viral Progression

The rapid spread of COVID-19 and other diseases has shown that understanding viral infection is critical to the health of people around the world. In particular, understanding the dynamics of the earliest stages of infection is important for developing prevention strategies, while understanding replication and late-stage processes are important for developing medical, pharmaceutical, and public health interventions. Human virus particles are typically between 20 and 200 nm in diameter, and so their visibility is just beyond the diffraction limit of optical microscopy. Not only do they come in varying sizes, but they also appear in a range of shapes and form factors. For many reasons, it is preferable to study single particles rather than conducting ensemble measurements, and high-precision positioning can provide the high spatial resolution that is required for this type of single-particle experiment.



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Hyperspectral Imaging Allows the Simultaneous Measurement of Fluorophores

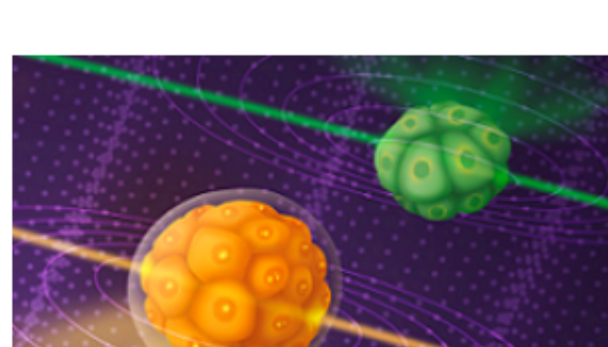
Hyperspectral imagers provide an image that produces a detailed spectrum for every pixel, capturing very minute details in a sample. Typically, this technology has been used to measure the spectral reflectance of materials such as agricultural products or components of biological tissue. It has the capability to produce a color image with a far greater color resolution than conventional imaging methods. With spectral channels from the tens to low hundreds, objects or materials are far more distinguishable than those generated by standard color cameras or with a bandpass filter that is used to block unwanted frequencies of light.



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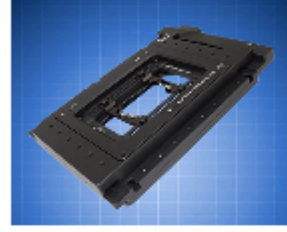
Century-Old Effect Applied for Study of Embryonic Development

Researchers have applied line-scanning Brillouin microscopy (LSBM), a microscopy technique based on Brillouin scattering, to visualize the mechanical properties of living cells over space and time, and to provide fast 3D imaging with low phototoxicity. Researchers at the European Molecular Biology Laboratory developed the approach, and used it to noninvasively track the mechanical properties of developing embryos at high speed and resolution.



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.: Featured Products & Services



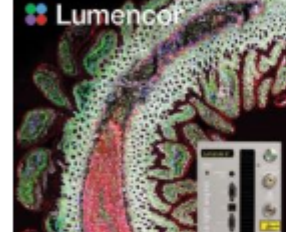
Ultra Precise Piezo-Z Focus Stage

Applied Scientific Instrumentation Inc.

The stage is capable of XY resolutions down to 10-20 nm and Z resolutions to the 1-nm range. It can be used with rapid z-sectioning and autofocus systems. It prevents focus drift when used with our CRISP system.

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Does your test and measurement equipment, inspection microscope, or industrial metrology hardware warrant best-in-class illumination, in terms of both brightness and stability? Do traditional lamps and lasers give you the optical power and consistency your application demands? Lumencor's SPECTRA Light Engine demonstrates best-in-class performance...

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Prior Scientific has developed OpenStand to offer a working platform to build OEM solutions and one-off customizations with excellent value for money and reduced development time. Whether developing new automation techniques and software or developing new imaging methods, you can quickly find that you need a microscope system tailored to your application.

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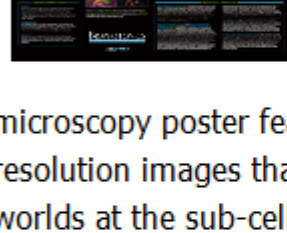
KeyLight™ by Phoseon Technology

Phoseon Technology Inc.

KeyLight™ is a compact light source that supports 3-7 channel fluorescence microscopy systems. It brilliantly illuminates your results by delivering intense, broad-spectrum UV and visible wavelengths for a wide variety of colors between 340 nm and 760 nm.

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Superresolution Microscopy Poster

Photonics Media

This superresolution microscopy poster features excellent, high-resolution images that reveal never-before-seen worlds at the sub-cellular level, illustrating the value of the techniques. Useful, at-a-glance definitions make this poster a great resource.

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Our optomechanical components are designed for precision positioning and alignment of optics and mirrors in a variety of photonics applications. Our products include manual positioning stages, lens and mirror mounts, kinematic mounts, breadboards, posts, and gimbals/goniometers.

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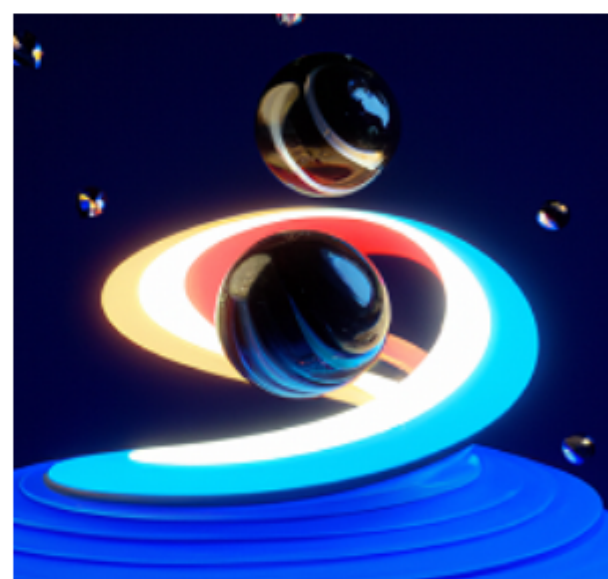
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.: In Case You Missed It

Lasers Help Mimic Biosystems as Team Prods Organisms' Reproduction

Researchers at New York University (NYU) have devised a system of asynchronous, optically driven micro-rotors that could be used to study far-from-equilibrium phenomena such as turbulent weather and biosystems. The advancement could potentially be used to replicate natural phenomena in engineered systems. In vortical flows, which are found in both meteorological and biological systems, particles move into orbital in the flow and their own rotation, resulting in a range of complex interactions. To better understand these dynamics, the researchers sought to replicate vortical flows at their most basic level. They created a system to move micro-particles using micro-rotors and a laser beam.



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Wearable Brain-Imaging Offers Alternative to 'Gold Standard' Method

Researchers at Washington University in St. Louis are developing an alternative to the current gold standard of brain imaging, functional magnetic resonance imaging (fMRI). The researchers' technology would allow subjects to move freely while high-resolution images of the brain are generated using light-based technology.

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Mobile-Based Image Reconstruction App Can Be Used at Point of Care

A mobile phone application for photoacoustic tomography (PAT) image reconstruction has demonstrated performance comparable to that of applications implemented on laptop computers and workstations. The first-of-its-kind application was developed by a team from Iowa State University, Nanyang Technological University, and the Stanford University School of Medicine. The mobile-platform-based application will enable low-resource and other clinical settings to reconstruct PAT images at the point of care, using an inexpensive, readily available smartphone.

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.: Upcoming Webinars



Advancing and Extending the Spectral Range for Imaging in Fluorescence Microscopy

Wed, Oct 18, 2023 10:00 AM - 11:00 AM EDT

This presentation discusses the advances in fluorescence illumination and detection in biological microscopy, expanding research capabilities from visible to SWIR spectral ranges. New versatile light sources and an innovative InGaAs camera system enable to precise excitation and imaging of fluorophores in biomedical applications, including in vivo and intra-vital microscopy. The incorporation of NIR and SWIR wavelengths allows visualization of previously unseen features with deeper imaging capabilities. The X-Cite® light sources deliver high excitation power across UV, VIS, and NIR, while the PCO® InGaAs camera ensures seamless imaging, making them essential tools for advanced biomedical research. Presented by Excelitas Technologies Corp.

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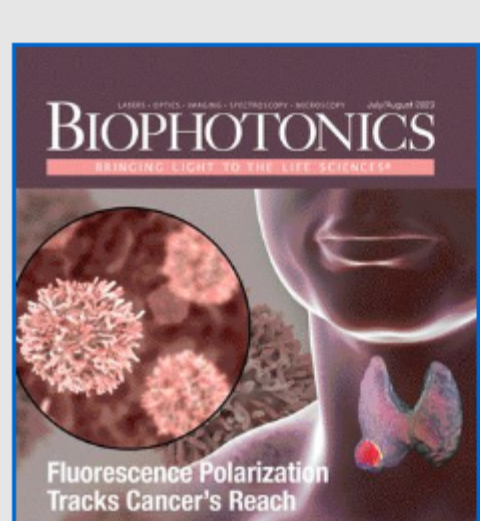
.: Next Issue:

Features

OCT System Design, Fiber Optic Probes, Fluorescent Microscopy, Photoacoustic Microscopy

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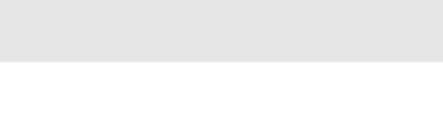
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