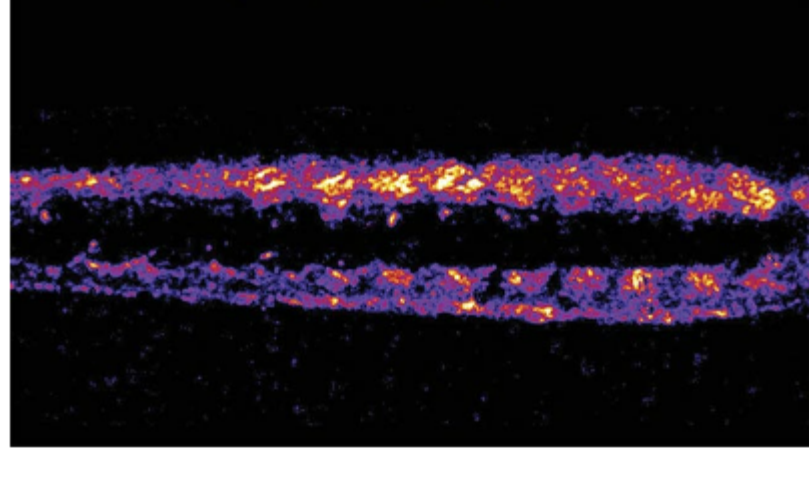




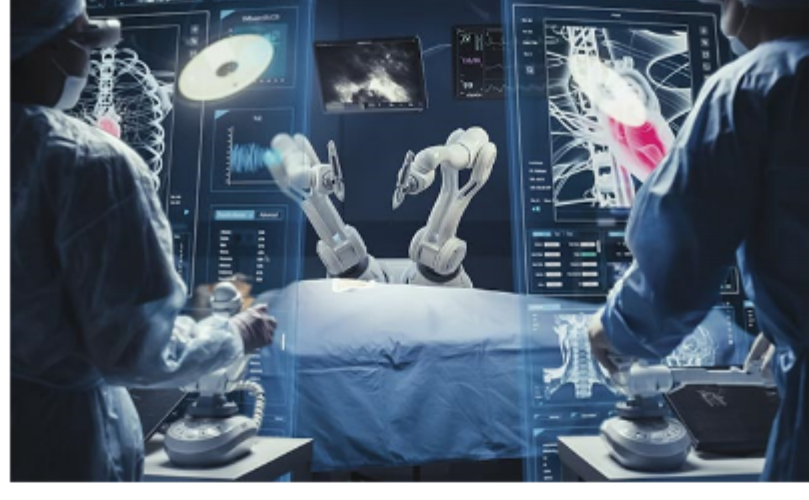
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Machine Learning Boosts Speed and Quality of Second-Harmonic Generation Microscopy

In biological research, the visualization of tissue structures is critical for understanding their function as well as in tracking the progression of diseases in various stages. Second-harmonic generation and polarization-resolved SHG microscopy provide powerful, noninvasive alternatives to

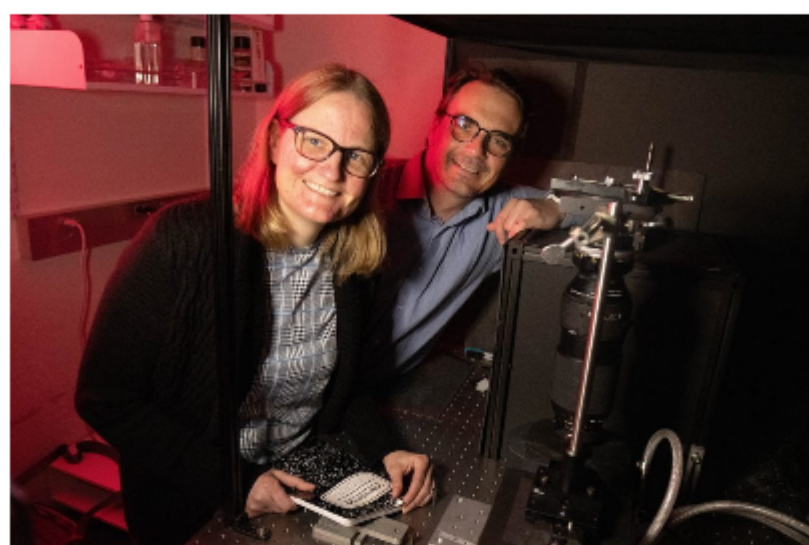
techniques such as fluorescence microscopy, cryogenic electron microscopy, and x-ray crystallography that enable the visualization of tissues without external labels or complex preparation, thus preserving sample integrity. [Read Article](#)



The Evolution of Fluorescence Illumination Is Refining Medical and Research Applications

Innovations in biomedical illumination technology are transforming various aspects of medical procedures, imaging techniques, and therapeutic interventions. Improved illumination enables surgeons to perform complex procedures with greater precision and better patient outcomes, particularly in minimally invasive and robot-assisted

procedures. In this context, advanced techniques in fluorescence allow many advantages, exciting the fluorophores within biological samples through external dyes, genetically modified fluorescent molecules, or leveraging intrinsic autofluorescence. [Read Article](#)

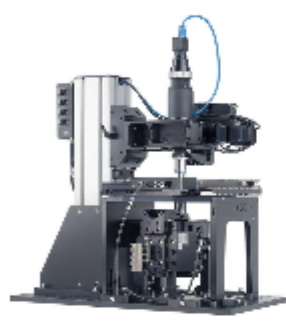


Bioluminescent Tags Track RNA Dynamics in Live Cells

A bioluminescent tag that can be attached to RNA will enable scientists to track RNA in real time as it moves through the human body. The bioluminescent RNA tag was developed by researchers at the University of California, Irvine. The researchers used luciferase, the enzyme that induces bioluminescence in fireflies, glowworms, jellyfish, and other organisms to make the tags. They engineered the RNA tags to

recruit light-emitting luciferase fragments, called RNA lanterns, upon the transcription of DNA into RNA. [Read Article](#)

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Light Activation Tool Could Help Ensure Targeted Drug Delivery

A light activation tool has been developed at the University of Geneva that can control both the activity and localization of various types of molecules in vivo. The tool could enable researchers to control a molecule at a specific location in a living organism without affecting the surrounding cells. It could be used for both research and medical treatments such as those for skin cancer. [Read Article](#)

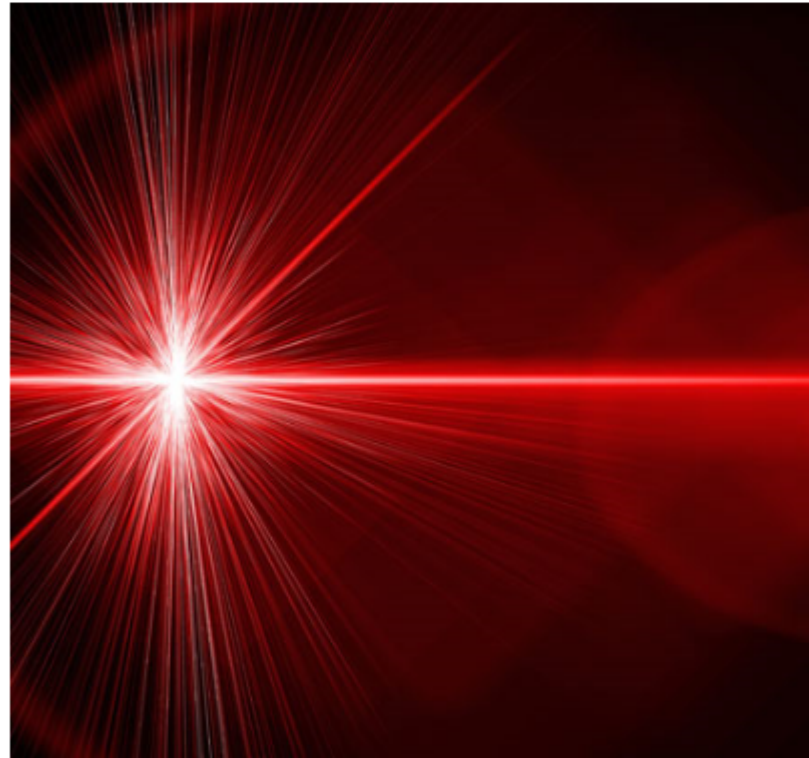
Ultrafast Spectroscopy Captures Acoustic Vibration of Single Virus

Using ultrafast spectroscopy, researchers at Michigan State University tracked the vibrational motions of single, unlabeled virus particles under ambient conditions across the megahertz to terahertz spectral range. The team's methodology, called BioSonic spectroscopy, promises to provide insight into viral dynamics without the need for labeling and could serve as a means for viral fingerprinting. [Read Article](#)

Robust, Low-Cost Laparoscope Could Improve Surgical Outcomes Worldwide

Laparoscopic surgery, a minimally invasive surgical technique for the chest and abdomen, significantly reduces post-procedure morbidity compared to open surgery. Despite its advantages, laparoscopic surgery remains largely inaccessible in low- and middle-income countries due to the high cost of the equipment and other logistical challenges. [Read Article](#)

Latest Webinars



Laser-Based Particle Analysis: Enhancing Industrial and Biomedical Measurement Systems

Tue, Apr 29, 2025 1:00 PM - 2:00 PM EDT

In this in-depth webinar, Jeremy Lane, Managing Director of the ProPhotonix Laser Business Unit, will explore the critical role of semiconductor diode laser technology in the detection, characterization, and analysis of particulates and dispersion droplets across a wide range of industrial and biomedical applications. Laser light scattering is a widely adopted technique for particle analysis, often combined with complementary methods such as spectroscopy — many forms of which also utilize semiconductor diode lasers. Together, these technologies play a vital role in applications ranging from verifying the quality of the output in industrial manufacturing processes to detecting and quantifying airborne pollution and dust particles in

environmental monitoring. In the biomedical field, laser-based systems are key to flow cytometry, where they are used to detect and characterize proteins on the surface of blood cells, measure cell size and shape, and support disease diagnostics. The webinar will also delve into how laser-based particle analysis is utilized to monitor dust concentrations in industrial environments, optimize milling processes, and aid in the development of new pharmaceuticals and food products. Don't miss this opportunity to learn how ProPhotonix's laser solutions can enhance your particle analysis applications across environmental, industrial, and biomedical sectors.

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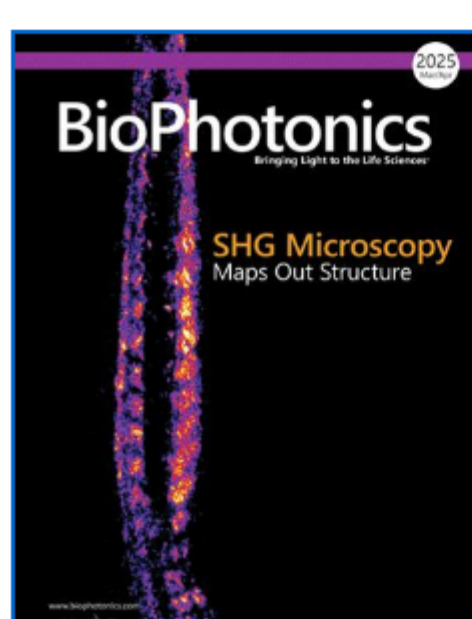
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