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**High-fidelity modeling.
Reliable results.**

Simulate with COMSOL Multiphysics® version 6.1 »



Understanding Resolution, Accuracy, and Repeatability in Micromotion Systems

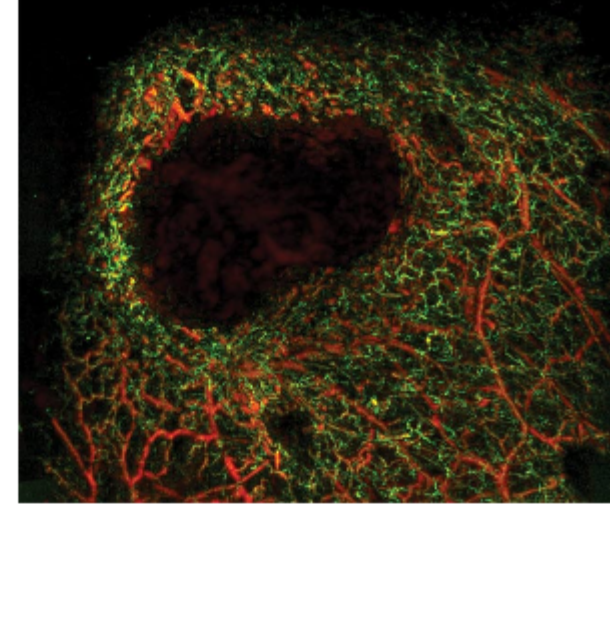
Resolution, accuracy, and repeatability are all metrics for measuring the critical requirements of motion systems. In addition to defining performance, they fundamentally define and affect system complexity, cost, and development time. Understanding these terms and how they are measured can help designers and integrators to further refine and optimize their instrument requirements.



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Multispectral Photoacoustic Imaging Peers into Skin Disease

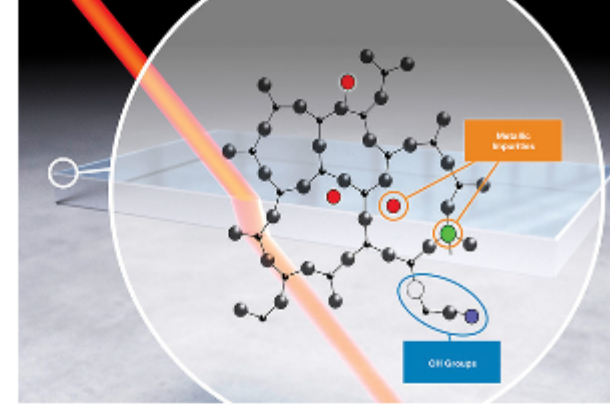
The earlier that skin diseases are detected, the greater the odds that a particular therapy will be effective and successful. Optical dermoscopy, today's medical standard for achieving early detection, allows experienced dermatologists to reliably find superficial changes denoting potential disease in the skin. But the method is not effective for early diagnosis of mutated structures in deeper layers of the skin. Until recently, such diagnoses required the histological evaluation of biopsies, which can cause pain and scars for the patient, and histology usually only provides results after days.



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Fused Silica: A Transparent Look at a Complex Material

Despite fused silica's deceptively simple formula, it can exhibit various characteristics based on the production processes and the raw materials employed, which makes it a very versatile optical material. In general terms, fused silica has a very broad optical transmission window, ranging from the UV to the near-infrared (NIR). It is chemically stable even in harsh environments and can sustain higher temperatures than many optical coatings. Additionally, the local variation of the fused material's refractive index, especially in larger optics, can be smaller than in aluminosilicate glasses. But is there more to distinguish the possible varieties of fused silica than a dry fused option for NIR optics and a wet one for UV applications?



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.: Featured Products & Services



IR Filters for Thermal Imaging

Spectrogon US Inc.

Spectrogon manufactures infrared filters and windows with high transmission, high rejection outside the passband, while maintaining excellent coating uniformity for thermal imaging and gas detection applications such as cryogenically cooled IR detectors and uncooled microbolometers. Our filters and windows range in dimension from Ø6.0 to Ø200.0 mm with dicing capabilities down to as small as 1.0 × 1.0 mm.

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SL160 Slide Loader

Prior Scientific Inc.

The SL160 automated microscope slide loader combines reliability and high capacity with easy set up to provide automated slide scanning to a wide variety of existing upright microscopes or with the use of Prior's OpenStand microscope.

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Now available! COMSOL Multiphysics® version 6.1

COMSOL Inc.

Major upgrades to platform features - the Model Builder, Application Builder, and Model Manager - as well as to many add-on products bring additional physics interfaces, new simulation tools, and enhanced workflows. Check out the release highlights to learn more!

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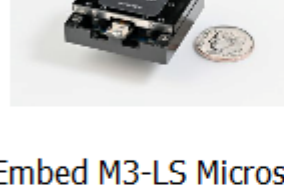
Norland Optical Splice

Norland Products Inc.

Norland's optical splice provides a high-performance connection for optic fibers in a unique one-piece design.

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New Scale Technologies Inc.

Embed M3-LS Microstages in Next-Gen Sequencing instruments for precise laser spot size and alignment in lanes, channels, or nanowells. High repeatability and accuracy, no thermal drift. Built-in 3.3V controller (I2C or SPI) - no separate electronics needed - minimizes size and time to market.

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Diffraction Gratings for Telecommunication

CASTECH INC.

CASTECH's high DE reflection grating is ideal for WSS and other applications in the optical communication industry. The high-precision design of the grating provides outstanding diffraction efficiency and perfect uniformity.

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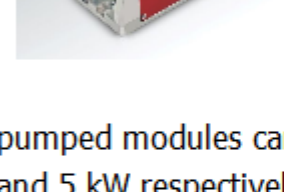
Flexible Wavelength Selector

SPECTROLIGHT Inc.

The Flexible Wavelength Selector is a unique and compact optomechanical device that utilizes the patented TwinFilm™ technology to deliver accurate wavelength tuning and precise bandwidth adjustment along with the imaging advantages of a circular aperture filter.

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High-Power Side-Pumped Modules

Focuslight Technologies Inc.

SP17 & SP18 high-power side pumped modules can offer peak power of 30 kW and 5 kW respectively while achieving higher small signal gain and better fluorescence distribution uniformity. SP17 & SP18 can be used for high-power solid-state laser pumping.

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LIGHT: Introduction to Optics and Photonics, Second Edition

Photonics Media

Offering a comprehensive treatment of the subject as well as key applications, and employing minimal math, LIGHT: Introduction to Optics and Photonics was written by readers in mind. This textbook is for beginning students of optics and photonics in high school, community college, and university STEM courses as well as for teachers and non-optics industry professionals looking for a basic understanding of the subject.

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MiniChrom - Monochromators

Optometrics Corp.

MiniChrom monochromator has a proven design that delivers excellent performance in a small package. Compact 75-mm focal length is the perfect solution for many OEM and laboratory applications. Available in both manual and motorized drive configurations.

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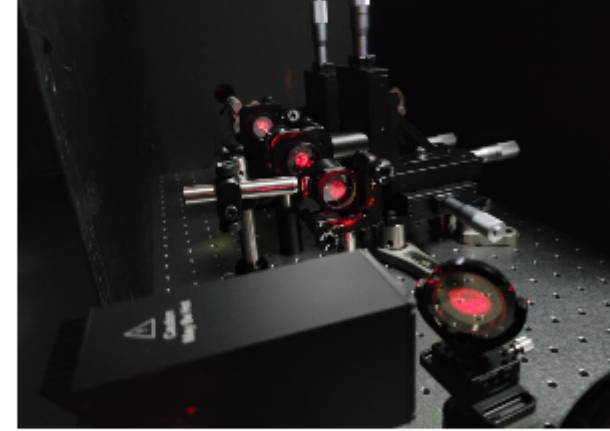
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.: In Case You Missed It

Self-Contained Light Trap Provides Near-Perfect Light Absorption

Researchers in Austria created a near-perfect "light trap" around a thin layer of material. In the system, the light beam is steered in a circle, then superimposed on itself so that the beam blocks itself and can no longer exit. Applications in light harvesting, energy delivery, and light control could benefit from the trapping approach. The system could provide a way to feed lightwaves from weak light sources, such as distant stars, into a detector.



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Technique Reduces Residual Warpage in Laser Powder Bed Fusion

In laser powder bed fusion for the additive manufacture of metal parts, local high-temperature molten metal fits the surrounding solid part as a result of thermal expansion. As a negative byproduct of this process, the molten metal generates a negative thermal stress following solidification, which produces an in-plane residual stress. This residual stress accumulates toward the upper layer with the repetitive formation process on each layer and often leads to undesirable effects such as delamination, cracking, and warpage. To address this issue, a team of researchers from Japan and the U.S. proposed an optimized design strategy for additive manufacturing. The team used multiple, distinct processes in the course of the work, including a numerical methodology called "recurrent formula inherent strain method." This method allowed the team to analyze the residual deformation. The researchers modeled the lattice based on the effective stiffness and anisotropic inherent strain using a gradient-based optimization algorithm.

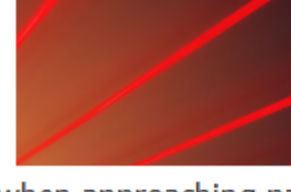
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Imaging System Speeds Diagnosis with Real-Time Biopsy Analysis

Results of a pilot study conducted at the University of Rochester showed that a system based on two-photon fluorescence microscopy (TPFM) enabled rapid diagnosis of non-melanoma skin cancer through real-time imaging of unprocessed, fresh tissue biopsies. TPFM imaging of non-melanoma skin cancer was able to occur within minutes of obtaining biopsies, and the system provided histological features comparable to those of conventional histology.

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.: Upcoming Webinars



Key Considerations for Part and Sample Holding in Interferometric Characterization

Wed, Jan 18, 2023 1:00 PM - 2:00 PM EST

Interferometry is a powerful tool when used to characterize optical surface form errors, as well as accumulated errors, whether measuring transmitted wavefronts. Opticians and engineers have many methods available to facilitate such measurements but can often overlook the effects caused by part holding or fixturing. Frank DeWitt of XONOX Technology Inc. discusses what should be considered when approaching part holding and fixturing for interferometric measurements, the features that are critical to the item being measured, and the required outputs of the measurement.

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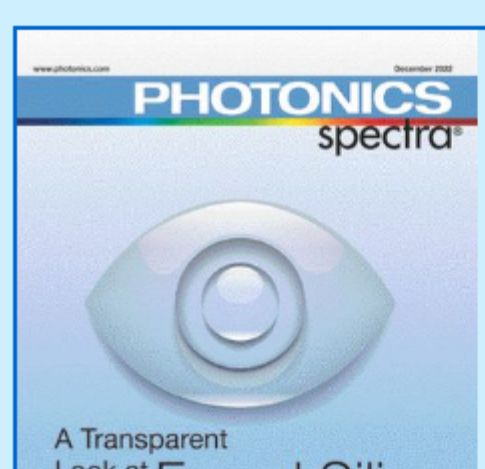
.: Next Issue:

Features

Micro-Optics, Quantum Photonics, Beam Measurement, Augmented Reality, Additive Manufacturing, SWIR Imaging

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

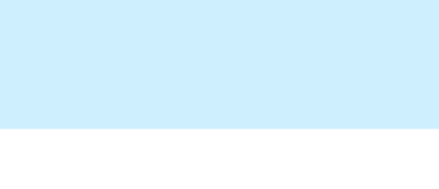
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