

Monthly newsletter from the editors of Photonics Spectra, with features, popular topics, new products, and what's coming in the next issue. Manage your Photonics Media membership at [Photonics.com/subscribe](https://www.photonics.com/subscribe).



Beam Profiling: What Is Your Laser Not Telling You?

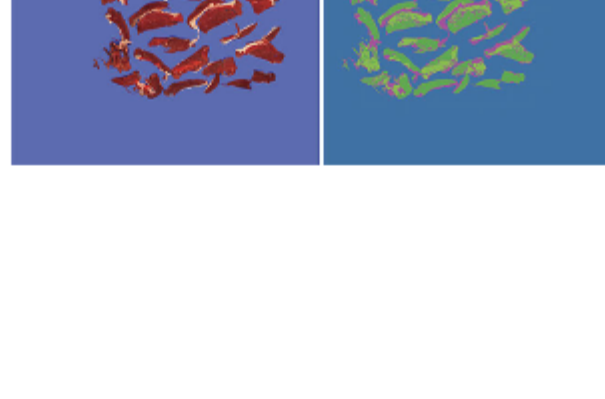
While it may seem intuitive that turning up the power on a laser will produce faster results in a materials processing operation, beam measurement tools often reveal that this only distributes the laser's energy over a larger area, resulting in a lower irradiance (energy per unit area) on target. Today's beam profiling instrumentation allows end users to tune their laser processes to achieve a precise irradiance that is intense enough for the task, but not so intense that a weld, for example, overheats and renders less optimal results.



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The Food Industry's Appetite for Hyperspectral Imaging Grows

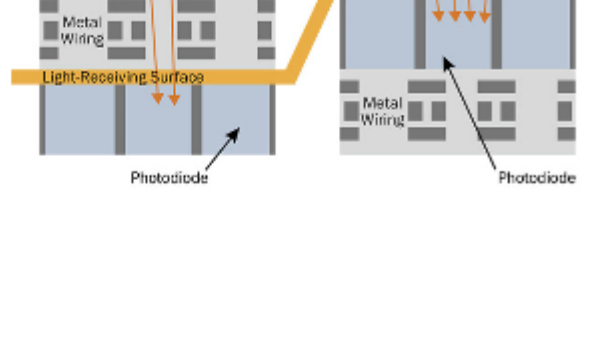
If the old maxim "you are what you eat" has any truth to it, then it becomes critically important to ensure that the food you consume is safe and of suitable quality. To this end, the U.S. Department of Agriculture spent \$1.1 billion in 2019 to support food safety and inspection operations, while state governments and industrial producers funded additional food safety and quality assurance efforts. Despite this, the Centers for Disease Control and Prevention estimates that 48 million Americans get sick every year from food-borne pathogens, foreign objects found in food, or poor-quality product. As a result, industry and researchers continue to seek new ways to improve the reliability, speed, and cost of food inspection.



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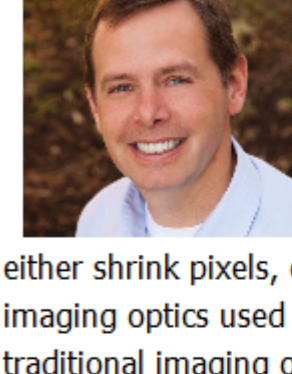
Camera Selection for Low-Light Imaging

Fluorescence microscopy is a broadly used term, with applications ranging from basic life science, such as time-lapse cell viability assays, to sophisticated techniques in which a very few photons or single molecules are detected and localized by specific high-end hardware and software. It further extends to even more sensitive biochemistry detection methods that leverage, for example, chemiluminescence and bioluminescence. Low-light imaging technology is instrumental to all of these microscopy applications, and often finds use in macroscopic optical systems. Although fluorescence microscopy technology is quite mature, camera selection for specific applications remains challenging. It can be complex to design a cost-effective optical imaging system that is optimized for a particular task, and end users can benefit from an overview of the major technical aspects that should be considered when choosing imaging components.



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.: Vision Spectra Conference



Presentation: "Shrinking Pixels and Growing Sensors: Two Approaches for Increasing Resolution"

Presented by: Greg Hollows, Edmund Optics

The drive for continuous innovation in machine vision results in a constantly increasing demand for higher resolution. Sensor manufacturers can take two main approaches to meet demand: They can either shrink pixels, or increase sensor size. Both options come with tradeoffs, in terms of sensor performance, and with the imaging optics used with them. Because of fundamental limitations in the pixel size that can be successfully used with traditional imaging optics, the sizes of the sensor and mounting interface must increase to accommodate demands for higher resolution.

Greg Hollows, vice president of the Imaging Business Unit at Edmund Optics in Barrington, N.J., goes into the meaning of this trend for lenses; the challenges the trend introduces for builders of machine vision systems; and solutions for getting the most out of sensors and lenses.

The inaugural Vision Spectra Conference runs July 20 - 22. Registration is free for the event, which is offered exclusively online. For more information and registration, please visit www.photonics.com/vsc2021. Continued coverage of this inaugural event will also be available on vision-spectra.com and [Photonics.com](https://www.photonics.com) leading up to the conference.

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.: Featured Products



[Micro-Precision 3D Printers](#)

Boston Micro Fabrication - BMF

A 2021 Prism Awards winner, the microArch S240 is a micro-precision 3D printer capable of achieving resolution of 2 µm~50 µm and tolerance of +/- 5 µm~25 µm, thus providing mold-free, ultra-high-resolution fast prototyping and end part capability. The microArch S240 is the perfect choice for industrial...

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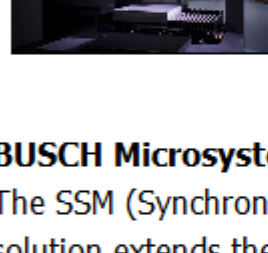
[TracePro Optics and Illumination Software](#)

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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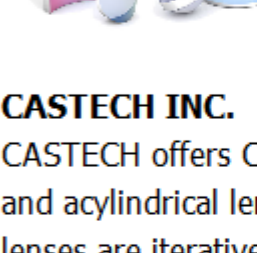


[High Precision Laser Processing with Synchronized-Scan Motion Technology](#)

BUSCH Microsystems Consult GmbH
The SSM (Synchronized-Scan Motion) Technology solution extends the processing area of a laser scanner system by combining the motion control of a scan head & XY stage, thus providing the ability to mark and process large substrates with exceedingly high accuracy and higher throughputs.

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[High-Precision Aspherical Lenses & Acylindrical Lenses](#)

CASTECH INC.

CASTECH offers CNC precision-polished aspherical and acylindrical lenses up to 200 mm. Our aspheric lenses are iteratively ground and polished under a software supported computer-controlled processing procedure to provide better controlled quality to guaranty the high performance of each aspheric lens.

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[NRO DII R&D Funding](#)

National Reconnaissance Office

The National Reconnaissance Office Director's Innovation Initiative (DII) Program funds cutting-edge scientific research in a high-risk, high-payoff environment to develop innovative concepts and creative ideas that transform overhead intelligence capabilities and systems for future national security intelligence...

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[Automated Glass Components Processing](#)

NYFORS Teknologi AB

The NYFORS SMARTSPLICER is a CO2 laser glass-processing system designed for the production of high-power and sensitive photonic components. It offers contamination free end-capping, splicing, tapering, bundling, and many other glass-shaping processes. NYFORS provides automated high-precision solutions...

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.: Featured Video



Product Demo: Automated Visual Inspection of Displays - Radiant Vision Systems

Watch a quick demo to see how scientific imaging systems enable fully automated visual inspection of illuminated displays and display components. ProMetric® Imaging Colorimeters and TrueTest™ Software from Radiant Vision Systems provide a comprehensive inspection solution for high-speed analysis of brightness, color, uniformity, contrast, mura, and defects, with pass/fail output based on user-defined parameters.

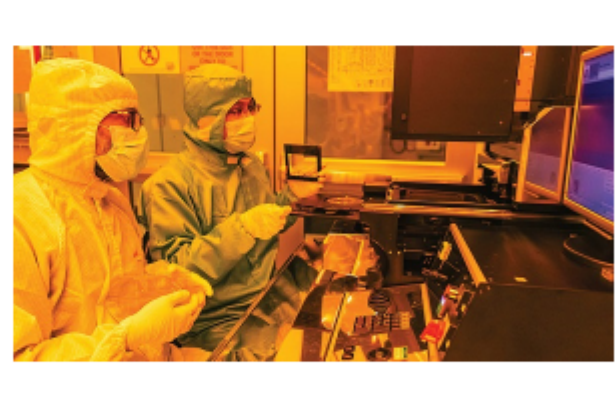
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.: In Case You Missed It

Nitride-Based MicroLED Emits Pure Red Light

MicroLEDs are a favored technology for next-generation displays, given their (small) size and energy efficiency. However, each LED is only able to emit light over a narrow range of colors. Devices can be created that combine many different LEDs that each emit a different color. Full-color displays can be created by combining red, green, and blue microLEDs. The problem, however is that an LED's emission color is determined by the material properties of the semiconductor. A microLED developed at KAUST is able to efficiently emit pure red light and could help in the quest to develop full-color displays based on a single semiconductor.

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Raman Spectroscopy Platform Delivers Insights on Intrinsically Disordered Proteins

Researchers from the Hong Kong University of Science and Technology (HKUST) developed optical tweezers-coupled Raman spectroscopy that can directly probe the structural features of alpha-synuclein, an intrinsically disordered protein that is closely linked to Parkinson's disease.

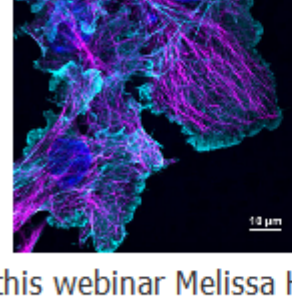
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Microscope Detects Chirality to Make Solid-Tissue Imaging Possible

Researchers at the University of Illinois' Beckman Institute for Advanced Science and Technology developed a spectroscopic imaging instrumental component of molecular conformations and orientations in biological samples. The device is the instrumental component of a measurement technique that the researchers said allowed them to increase the speed and accuracy at which they obtained images of such samples at the microscopic level.

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.: Upcoming Webinars



Multi-Line Lasers or Laser Combiners: What Solution Is Best for Fluorescence Imaging?

Thu, Jun 17, 2021 10:00 AM - 11:00 AM EDT

Fluorescence based microscopy for high-resolution and high-throughput multi-fluorophore imaging typically relies on the use of several individual laser sources at different wavelengths, within the same instrument. Navigating the field of laser-based multi-color excitation options can be challenging. In this webinar Melissa Haahr and Helge Schmidt, Ph.D., of HÜBNER Photonics discuss the advantages of multi-line lasers and laser combiners with the aim to help identify the suitability of either solution for applications in fluorescence imaging. Presented by HÜBNER Photonics.

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Polarization Extinction Ratio Measurement in Highly Birefringent Materials: Challenges and Solutions

Wed, Jun 23, 2021 1:00 PM - 2:00 PM EDT

This webinar with Wajih Daab, product line manager for Luna Innovations, discusses the Polarization Extinction Ratio (PER) testing solutions offered by Luna which help manufacturers accelerate the testing time and improve measurement accuracy. Presented by Luna Innovations, Inc.

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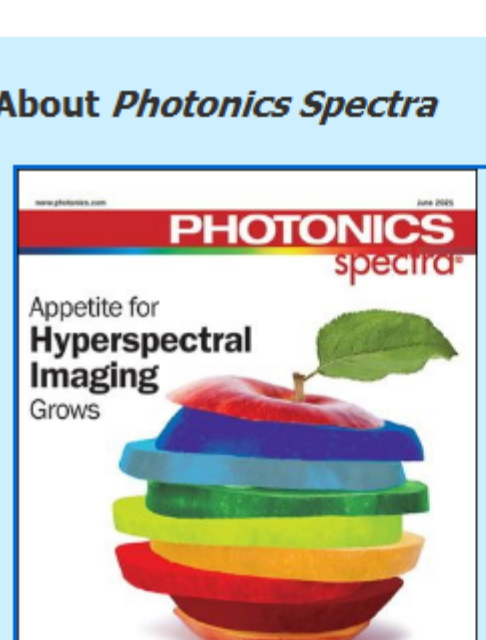
.: Next Issue:

Features

Speckle-Free Lasers, UV-Vis Spectroscopy, DUV Lithography, and more.

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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