

# OPTICS

## Tech Pulse



### April 2020

Optics Tech Pulse is a special edition newsletter from Photonics Media and LaCroix Precision Optics covering key developments in optics technology.

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### The Microscope Enters the Digital Age

Since its early development, the microscope has undergone little change in optical design, while the optical resolution theoretical limit was already achieved many decades ago. But change is happening, as augmented reality is being incorporated into the way microscopes are used in the laboratory setting.



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 LaCroix Precision Optics offers a prototype expedited delivery service (PEDS) to help shorten lead times to four to six weeks, or faster when necessary. LaCroix Precision Optics specializes in spherical lenses, aspheres, achromatic doublets, windows, wedges, prisms, beamsplitters, and custom optical coatings.



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### Hyperspectral and Multispectral Imaging

Hyperspectral and multispectral imaging are increasingly beneficial for a range of applications as diverse as agriculture, health care, and remote sensing. Both technologies present advantages over standard machine vision imaging, which uses light only from the visible spectrum. However, with the benefits of HSI and MSI comes increased complexity of the imaging systems in terms of lighting, filtering, and optical designs.



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### An Integrated Optical System for Containing COVID-19 in Airports

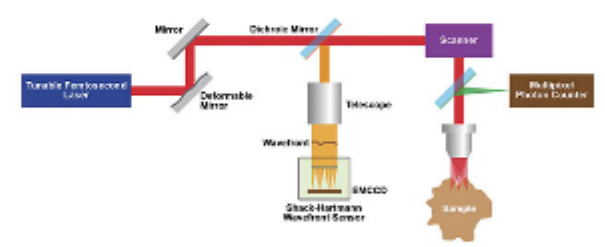
Will automated infection tracking become standard procedure in airports around the world? Real-time thermal monitoring combined with biometric data that could be immediately extracted and analyzed would help airport personnel quickly identify individuals with potential illness in even the most crowded terminals. Possible points of contact with the individual could also be tracked and identified.



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### Multiphoton Microscopy Points Imaging to New Depths

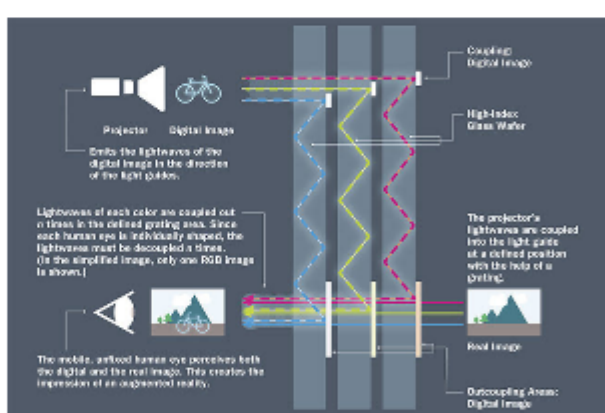
While multiphoton excitation is now firmly established as a front-line tool in microscopy, it is still an evolving field producing a steady stream of new applications and techniques, all supported by advancements in lasers and microscopes. A key trend is the push for deeper imaging in vivo.



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### Full-Immersion AR: The Path to Consumer-Friendly Devices

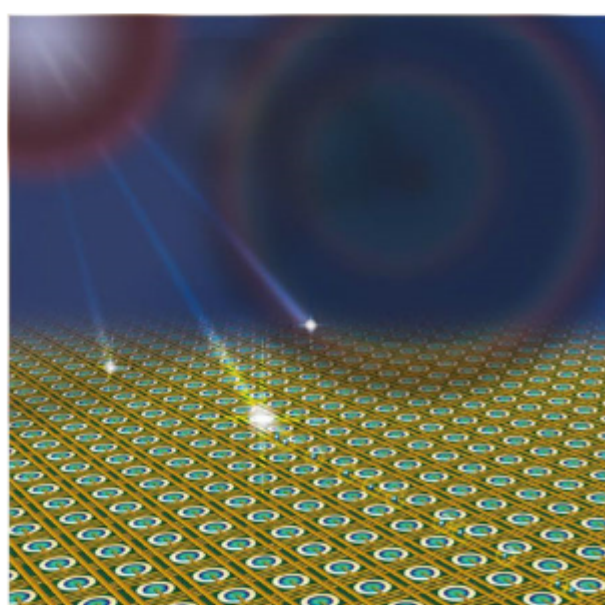
Augmented and mixed reality (AR/MR) devices are perceived by some as the next big thing in consumer electronics. These devices could form the basis of the next great computing revolution, joining the ranks of smartphones and personal computers as a foundational technology that changes the way we live, work, and play. But getting an AR/MR consumer-grade product ready for mass-market adoption is still a challenge.



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### Photon-Counting Camera Captures 3D Images with Record Speed and Resolution

A megapixel camera, based on time-gated, single-photon avalanche diode (SPAD) image sensors, has been developed at École polytechnique fédérale de Lausanne (EPFL). The camera can detect single photons and convert them into electrical signals at a rate of about 150 million times per second.



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### The Reality of Intelligent Manufacturing

Smart manufacturing — also called “lights-out manufacturing” or “dark factories” for their ability to operate without humans present and thus without lights or heat — uses all kinds of photonics technology, including lasers, optical sensors, HD cameras, photonic integrated circuits, touch displays, fiber optics, optical waveguides, and 3D machine vision, not to mention an abundance of associated lenses, prisms, and coatings.



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