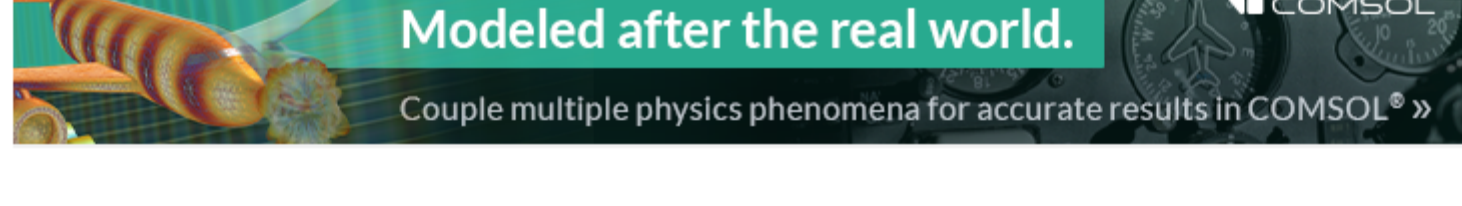


# PHOTONICS spectra®

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## Terahertz Radiation Boosts Quality Control from Aerospace to Pharma

Contact-free thickness measurements are increasingly important in industrial process monitoring and quality control. In the automotive and aviation industries, the exact thickness of paint and coating layers not only affects the overall appearance but also the level of protection against UV radiation and corrosion. In pharmaceuticals, the coating thickness governs the release of the drug within the human body, affecting a drug's efficacy and potential side effects. Within the semiconductor industry, highly homogeneous polymer coatings protect against moisture and dust and function as stress absorbers.

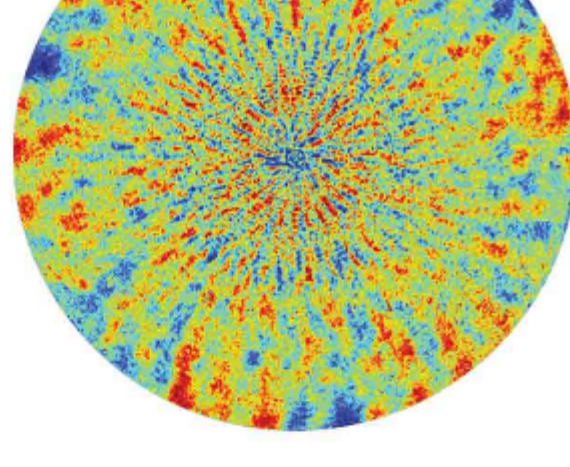
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## New Technology Quantifies Optics' Elusive Mid-Spatial Frequencies

New polishing technologies caused a significant shift in optical manufacturing during the start of the 21st century. Computer numerical control (CNC) and deterministic optical polishing/figuring techniques have taken center stage to transform how optics are produced. These advancements have enabled CNC machinists to craft aspherical and free-form optical surfaces, tasks that were impossible or demanded highly skilled artisans using traditional pitch polishing methods. However, this progress has come with a challenge: the introduction of mid-spatial frequency surface errors.

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## Ultrafast Imaging Sprouts New Applications in the Life Sciences

The snapping shrimp's claw can shut so quickly that it fires out a jet of water, generating a bubble that collapses to create the signature snap. But when those bubbles collapse, the cavitation also releases plasma and light energy. The snapper shrimp uses this effect to communicate or stun its prey. But its unique talent also generates underwater plasma more efficiently than electrically induced microbubbles or laser-induced cavitation bubbles. Efforts to mimic the crustacean's biomechanics had fallen short until 2019, when researchers from Texas A&M University published a paper in *Science Advances* detailing how they had developed a bio-inspired device that could emulate the snapper shrimp's talent for efficient plasma generation. They achieved this with the help of ultrafast imaging.

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## Featured Products & Services



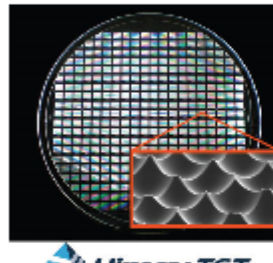
### NESSIE Laser Scan Microscope

#### MONSTR Sense Technologies

The NESSIE laser-scanning microscope by MONSTR Sense rapidly raster scans any laser input over your sample with submicron resolution, providing advanced hyperspectral images in seconds. Integrating NESSIE with our BIGFOOT Ultrafast Spectrometer further enables imaging with femtosecond time resolution.

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### Wafer-Level Optics

#### Himax IGI Precision Ltd.

Wafer-level optics solutions from origination and nano-imprinting to assembly. Using advanced lithography and other manufacturing processes, a wide variety of micro/nano structures are created according to customers' desires in applications including refractive/diffractive optics, imaging optics, freeform optics, and many more.

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### QFC Connector

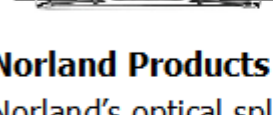
#### Coastal Connections

Coastal Connections has produced thousands of Space Flight Cables over the past 15 years for government labs, defense contractors, and commercial companies.

Our cables are used in lidar, free space laser communications, and other applications. The QFC connector is compatible with standard FC connectors.

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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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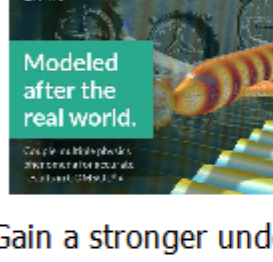
### IR Filters for Thermal Imaging

#### 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.

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### Multiphysics Modeling & Standalone Apps Drive Innovation

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## In Case You Missed It

### Compact Accelerator Achieves Major Energy Milestone

A compact particle accelerator developed by the University of Texas at Austin, several national laboratories, and the Texas-based company TAU Systems has produced an electron beam with an energy of 10 billion electron volts (10 GeV). The accelerator, less than 20 m long, is among three in the United States capable of producing an energy level that high, though the other two are both approximately 3 km long.

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### Technique Generates Precise Wavelengths of Visible Laser Light

By adding tiny, periodic bumps to a microresonator, researchers were able to convert near-infrared laser light into specific desired wavelengths of visible light with high accuracy and efficiency. Developed by the National Institute of Standards and Technology (NIST) and its colleagues at the Joint Quantum Institute (JQI), a research partnership between the University of Maryland and NIST, the technique has potential applications in precision timekeeping and quantum information science, which require highly specific wavelengths of visible laser light that cannot always be achieved with diode lasers.

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### Researchers Fabricate Back-Contact Micrometric Photovoltaic Cells

Researchers have manufactured back-contact micrometric photovoltaic cells, a world-first, according to the multi-institutional collaborators. The work paves the way for a new era of miniaturization for electronic devices. The cells, with a size twice the thickness of a strand of hair, have significant advantages over conventional solar technologies, reducing electrode-induced shadowing by 95% and potentially lowering energy production costs by up to three times.

[Read Article](#)

## Upcoming Webinars



### Laser Application for Display Manufacturing

Tue, Jan 16, 2024 10:00 AM - 11:00 AM EST

Displays are windows into the connected world as nearly every consumer device today has a display and a smartphone without one is impossible to imagine. To produce state-of-the-art displays lasers must be utilized, especially to create high-end and high-resolution designs. Dr. Oliver Haupt from Coherent focuses on OLED displays for smart phones as well as the adoption of OLED displays in the IT sector. He also addresses the incremental market opportunity for MicroLED displays from the very small range in AR to the very large 4K TV market. Finally, he explains how over the last few years more and more UV short wavelengths lasers have been required and implemented in production due to the display material combinations, increase of active display areas, and pixel sizes down to the micron level. Sponsored by LightMachinery Inc.

[Register Now](#)

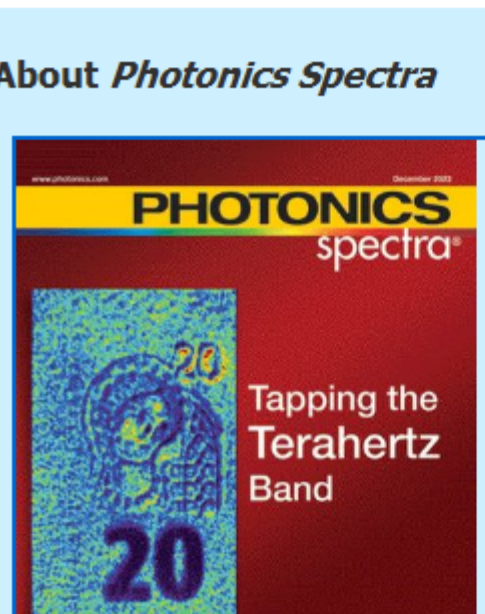
## Next Issue:

### Features

Raman Microscopy, Deep-Ultraviolet (DUV) Sources, Optical Computing, and Lasers for Quantum Computing

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