

# IMAGING

## Tech Pulse



### December 2017

Imaging Tech Pulse is a special edition newsletter from Photonics Media and PCO-TECH Inc. covering key developments in imaging technology. Manage your Photonics Media membership at [Photonics.com/subscribe](http://Photonics.com/subscribe).

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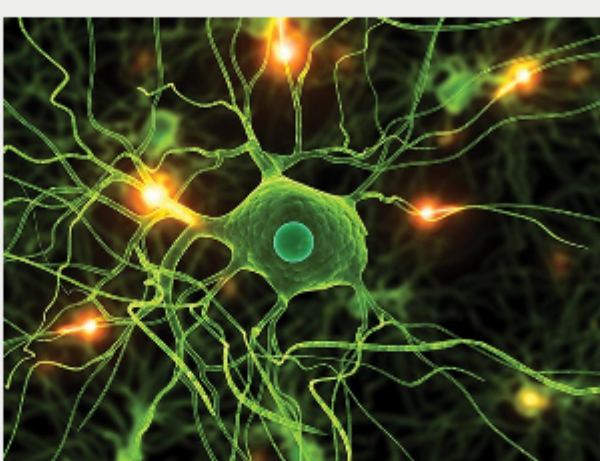
small **but** powerful



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### Imaging Trends Broadening R&D Applications

Imaging is an expansive market where technological advances in microscopy, lasers and other techniques are resulting in a growing number of applications and functions. Among imaging techniques, fluorescence microscopy is a developing method for studying tissue in situ and in real time.



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PROMOTED CONTENT



### Being a Camera User - Do You Need a Large Dynamic Range?

The "dynamic" or "dynamic range" of an image sensor or a camera system is a widely used term to characterize the ability of a camera system to measure and distinguish different levels of light. The correct expression for it is "intra-scene dynamic" or "intra-scene dynamic range", but usually camera manufacturers just refer to "dynamic" or "dynamic range" in their technical data sheets and advertisements. In the field of photography, the dynamic range is analogous to the contrast range.



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### Fast EEF Spectroscopy Quantifies Unstable Samples

Fluorescence spectroscopy is used routinely to analyze all types of luminescent samples, from solid materials for semiconductor devices to fluorescent probes for medical imaging. And in a mixture of many fluorescent compounds, it is possible to identify each one by its combination of excitation and emission wavelengths.



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### Camera Design Mimics One of Nature's Most Sophisticated Visual Systems

The bio-inspired design of an ultrasensitive camera that is capable of sensing both color and polarization is based on the visual system of the mantis shrimp. The camera features a single-chip, low-power, high-resolution color-polarization imaging system. The imager captures co-registered color and polarization information in real time with high resolution by monolithically integrating nanowire polarization filters with vertically stacked photodetectors.



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### Children's National Health Researchers Use IR Thermal Imaging for Inspection Protection

Infrared thermal imaging has been used as a tool to detect defects in lead aprons meant to shield patients' vital organs from radiation exposure. The IR imaging technology reduces ionizing radiation exposure for inspectors who check the protective lead aprons.

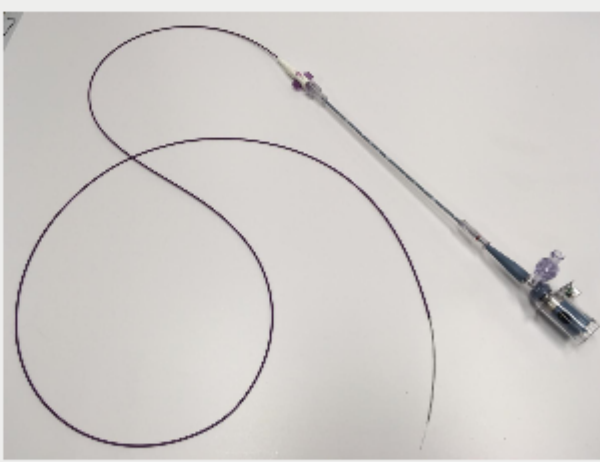


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### Device Combines Ultrasound and Multispectral Fluorescence to Measure Plaques

A novel cardiac catheter probe combines intravascular ultrasound (IVUS) and fluorescence lifetime imaging (FLIM) in a single device that can image the arteries of a living heart. The catheter can simultaneously retrieve structural and biochemical information about arterial plaque that could help physicians more reliably predict heart attacks.



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### Photodetector Uses Ultrathin Materials to Increase Efficiency

A prototype developed using quantum mechanical processes could usher in a novel class of ultra-efficient photodetectors that would enable solar cells to turn the light they receive into multiple electrons. The prototype is based on the efficient multiplication of interlayer electron-hole (e-h) pairs in 2D semiconductor heterostructure photocells.



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