Tuesday, November 14, 2017

SENSORS & DETECTORS

Tech Pulse

PHOTONICS MEDIA

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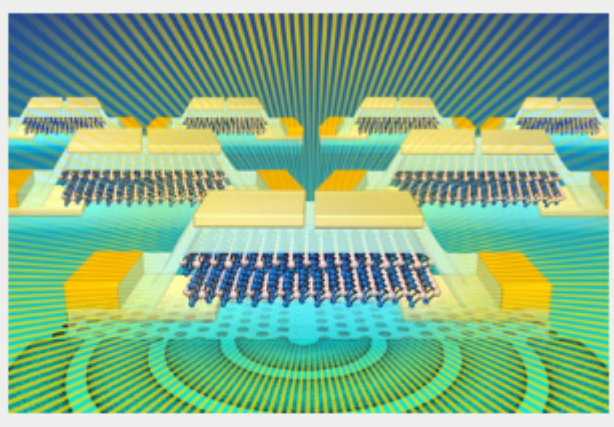
Sensors & Detectors Tech Pulse is a special edition newsletter from Photonics Media and Electro-Optics Technology covering key developments in sensors and detectors technology. Manage your Photonics Media membership at Photonics.com/subscribe.

Optical Solution Addresses Interconnect Bottleneck on Silicon Chips

A combination light emitter and detector device that is compatible with silicon could help mitigate communications delays resulting from signal leakage between microchip components. The device is made from molybdenum ditelluride ($MoTe_2$), an ultrathin semiconductor that belongs to an emerging group of materials known as 2D transition-metal dichalcogenides (TMDs).



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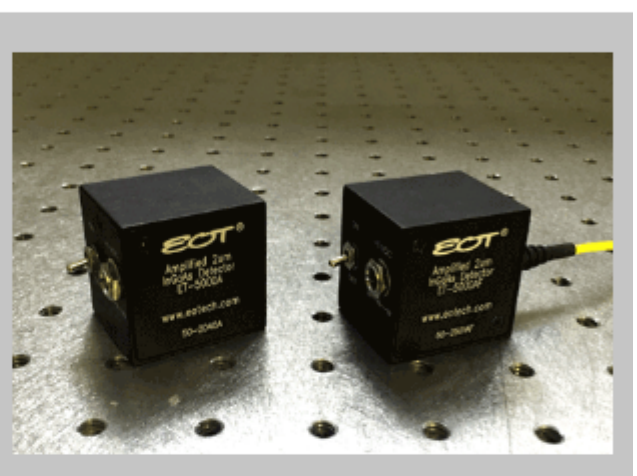
PROMOTED CONTENT

Electro-Optics Technology Inc.

>10GHz Amplified Photodetectors

EOT's >10GHz Amplified Photodetectors feature a large bandwidth, high gain, and compact size to meet all your application needs including ultrafast, heterodyne, and high frequency applications. The >10GHz Amplified Photodetectors will provide you with a fast, amplified photodetector that can measure low power, ultrafast pulses at an affordable price. EOT's >10GHz Amplified Photodetectors contain PIN photodiodes that utilize the photovoltaic effect to convert optical power into an electrical current and a fixed gain transimpedance amplifier allowing measurement of <1mW input powers. When terminated into 50Ω into an oscilloscope, the pulsewidth of a laser can be measured.



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Detector Options for Low-Light Applications

The silicon photomultiplier (SiPM) is a solid-state photodetector whose sensitivity to light rivals that of a photomultiplier tube (PMT) in a regime where a few hundred photons per second illuminate the detector. A very high internal gain gives SiPMs and PMTs extraordinary photosensitivity unmatched by any other photodetector. Although they have similar gains, SiPMs have several other attributes making them attractive as a detector choice vis-à-vis PMTs, including a low operating voltage and immunity to magnetic fields.

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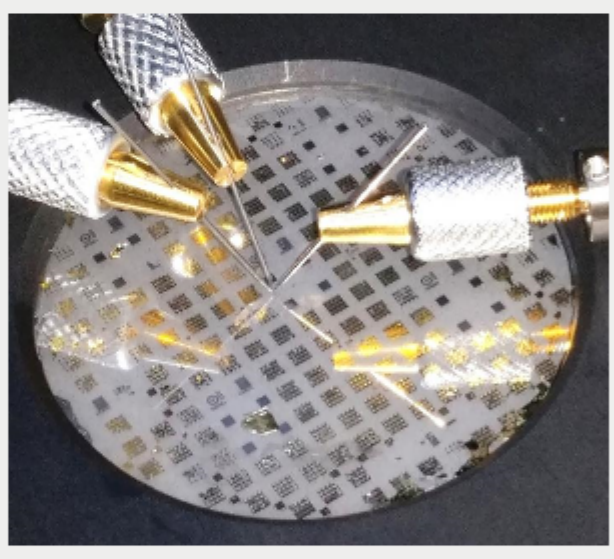
Gas Sensors Transfer Easily to Different Substrates Without Degrading Performance

A transfer technique based on thin layers of boron nitride could allow high-performance gallium nitride gas sensors to be grown on sapphire substrates and then transferred to metallic or flexible polymer support materials. The technique could facilitate the production of low-cost wearable, mobile and disposable sensing devices for a wide range of optoelectronic applications.



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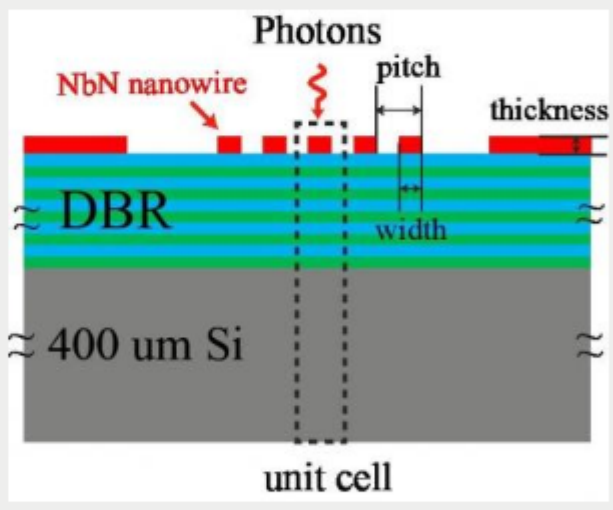
Superconducting Nanowire Single-Photon Detector Sets Efficiency Record

Researchers have demonstrated the fabrication and operation of a superconducting nanowire single photon detector (SNSPD) with detection efficiency that they believe is the highest on record. The research team believes that such results could pave the way for the practical application of SNSPD for quantum information and other high-end applications.



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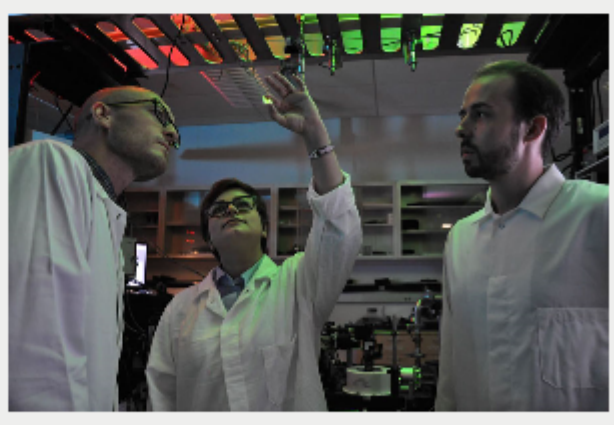
Photodetector Uses Ultrathin Materials to Increase Efficiency

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. To build the prototype, researchers stacked two atomic layers of tungsten diselenide (WSe_2) on a single atomic layer of molybdenum diselenide ($MoSe_2$).



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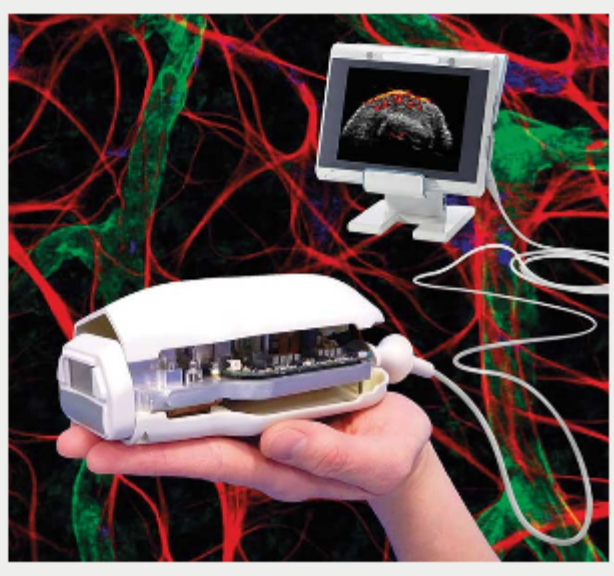
Pulsed Laser Diodes Can Hasten Clinical Use of Photoacoustic Imaging

Photoacoustic imaging (PAI) has been shown to have potential for early detection of afflictions such as skin and thyroid cancer, cardiovascular disease and arthritis. The noninvasive technique combines pulsed laser light for the excitation of tissues with an ultrasound transducer as a receptor. PAI penetrates much deeper than purely optical imaging technologies and offers greater specificity than conventional ultrasound imaging.



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