

# FutureHorizons



The Global Semiconductor Industry Analysts

## FH MONDAY

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### Silicon Photonics Merging Ahead

Just over a decade ago the likes of Intel and IBM were announcing performance records for the basic silicon photonics building blocks -- modulators and detectors -- used to make optical devices.

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### Quantum Computing on Cusp

Today only a single company — D-Wave Systems — produces a commercial quantum computer, and even D-Wave admits its latest "2X" is no substitute for a supercomputer (except for a small set of optimization tasks).

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### Snapdragon-based LTE modul boosts car connectivity

Qualcomm has introduced a variant of its connected car reference platform using the flagship Gigabit class Snapdragon X16 LTE modem to help car manufacturers deliver the high-speed, high-quality and reliable connectivity required for advanced telematics and connected vehicle services

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### TALK TO US



### Smartphone Senses Anything

A smartphone with a built-in spectrometer that can sense nearly any substance is promising to bring to the masses a whole new category of capabilities. The phone's makers say it can, for example, sense spoiled milk, a drink's alcohol content, a food's ingredients, counterfeit pills, poison and nearly .....

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### EVENTS

#### [Silicon Chip Industry Seminar](#)

– 13 March 2017 – London UK

#### [Industry Forecast Briefing](#)

– 17 January 2017 – London UK

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### Semiconductor discs could boost night vision

A new method of fabricating nanoscale optical crystals capable of converting infrared to visible light has been developed by researchers in Australia, China and Italy. The new technique allows the crystals to be placed onto glass and could lead to improvements in holographic imaging – and even the development of improved night-vision goggles.

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## **Silicon Photonics Merging Ahead**

Just over a decade ago the likes of Intel and IBM were announcing performance records for the basic silicon photonics building blocks -- modulators and detectors -- used to make optical devices. Now, companies are shipping complex silicon photonics-based integrated circuits as part of their products.

When we started writing our book in late 2014, the frenzied excitement that first greeted silicon photonics had been replaced with an industry pragmatism. Companies realized the scale of the challenges to be overcome to bring the technology to market.

These challenges are not just technical issues but also business ones such as identifying markets, driving down cost and identifying where the technology will have an edge. Silicon photonics is competing with indium phosphide and gallium arsenide, mature technologies that already serve the optical component industry.

## **Quantum Computing on Cusp**

LAKE WALES, Fla. — Today only a single company — D-Wave Systems — produces a commercial quantum computer, and even D-Wave admits its latest "2X" is no substitute for a supercomputer (except for a small set of optimization tasks). Within five years, however, all that may be changed.

Quantum computing uses qubits (quantum bits) on the atomic scale; it is predicted to be faster and able to store more data than transistor-based computing. Some researchers are predicting that the market for "universal" quantum computers that do everything a supercomputer can do plus everything a supercomputer can not do — in a chip that fits in the palm of your hand — will be burgeoning. The rise of quantum computing may be as important a shift as John von Neumann's stored program-and-data concept.

## **Snapdragon-Based LTE Module Boosts Car Connectivity**

Qualcomm has introduced a variant of its connected car reference platform using the flagship Gigabit class Snapdragon X16 LTE modem to help car manufacturers deliver the high-speed, high-quality and reliable connectivity required for advanced telematics and connected vehicle services – supporting peak download speeds up to 1Gbps.

The reference platform is designed to allow car makers to quickly and easily integrate the broad range of additional wireless and networking technologies required in today's vehicles, including Wi-Fi, Bluetooth, Bluetooth Low Energy and Global Navigation Satellite System (GNSS), with optional support for DSRC and Cellular-V2X.

Qualcomm has also developed a reference hardware module in two different band configurations, North America and rest of world (including Europe).

## **Smartphone Senses Anything**

LAKE WALES, Fla. — A smartphone with a built-in spectrometer that can sense nearly any substance is promising to bring to the masses a whole new category of capabilities. The phone's makers say it can, for example, sense spoiled milk, a drink's alcohol content, a food's ingredients, counterfeit pills, poison and nearly anything else.

The key component is a tiny near-infrared spectrometer which is made by Analog Devices Inc. (Norwood, Mass.), designed by Consumer Physics Inc. (Tel-Aviv, Israel) and integrated into an iPhone-lookalike made by Sichuan Changhong Electric Co. (China).

The Changhong H2 smartphone — with a giant six-inch screen and 2-GHz, 8-core application processor — is the first smartphone to use Consumer Physics' spectrometer. Many more sensing products are on-the-way from other original equipment manufacturers (OEMs), such as GE for its refrigerators. The Changhong H2 was shown for the first time at the Consumer Electronics Show 2017 (CES).

## **Semiconductor Discs Could Boost Night Vision**

A new method of fabricating nanoscale optical crystals capable of converting infrared to visible light has been developed by researchers in Australia, China and Italy. The new technique allows the crystals to be placed onto glass and could lead to improvements in holographic imaging – and even the development of improved night-vision goggles.

Second-harmonic generation, or frequency doubling, is an optical process whereby two photons with the same frequency are combined within a nonlinear material to form a single photon with twice the frequency (and half the wavelength) of the original photons. The process is commonly used by the laser industry, in which green 532 nm laser light is produced from a 1064 nm infrared source. Recent developments in nanotechnology have opened up the potential for efficient frequency doubling using nanoscale crystals – potentially enabling a variety of novel applications.