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GRAPHENE FLAGSHIP

GRAPHENE EXPERIENCE ZONE



**IOT AND
SENSORS**



**WEARABLES
AND HEALTH**



DATACOM



ENERGY



**COMPOSITES
AND
PRODUCTION**

Curated by:

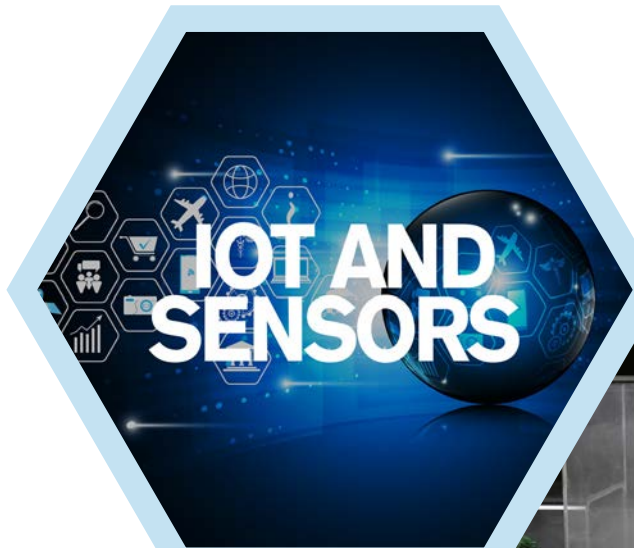
ICFO

The Institute
of Photonic
Sciences

 **MOBILE**[™]
WORLD CONGRESS

NEXTech Hall 8.0 M33

BARCELONA 27 FEB-2 MAR 2017



IOT AND SENSORS



CAR COLLISION-AVOIDANCE SYSTEM

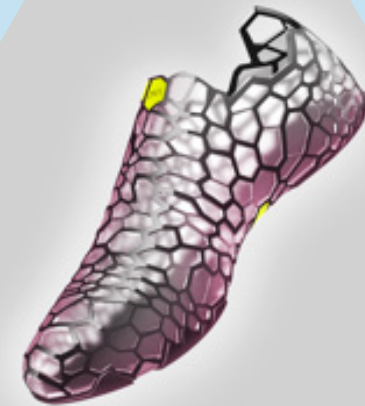
Graphene extends the vision of conventional digital cameras, enabling vision during the night and through fog. Here, ICFO shows a prototype that enables self-driving cars to navigate safely under extremely difficult weather conditions. The imaging technology is based on low-cost production processes and CMOS technology.

WINE TESTING

Using a smartphone camera, a device developed by ICN2 is able to measure the quality of wine samples as well as very quickly detect the presence of some pesticides in water or food samples. The measurement and detection are based on the photoluminescence quenching of graphene quantum dots when they get in contact with certain type of polyphenols compounds.

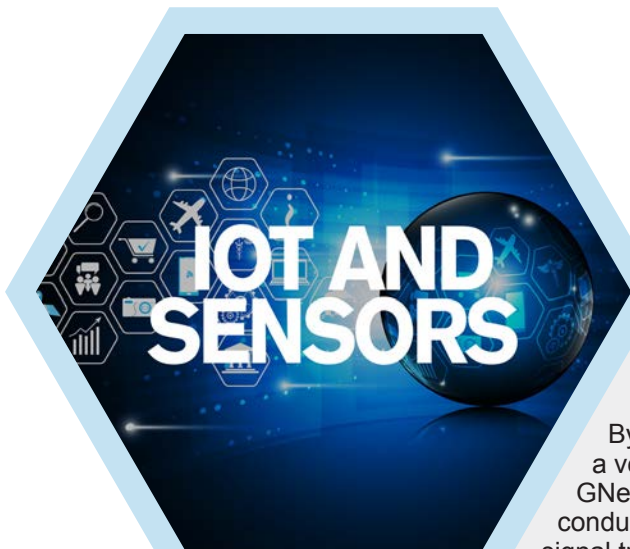
GRAPHENE MECHANICAL PIXELS

The screen prototypes of TU Delft and Graphenea change the colour of a graphical element with electricity. The visitor uses a control box to change the colours and can zoom in to find the super high resolution achieved by Graphene Interferometric Modulator Display (GIMOD) technology. The individual pixels are 5-10 times smaller than Apple's retina display.



SENSING INSOLE FOR SPORTS SHOES

Modern sports require shoes to be lighter, stronger and sensory, in order to improve performance and monitoring the status of athletes. The University of Cambridge will demonstrate a 3D printed shoe with embedded graphene foam sensors to monitor the pressure applied, combining complicated structural design with accurate sensing function.



IoT AND SENSORS

FILM SENSORS

The University of Cambridge is showing a graphene gauge- sensing film printed on the underside of the cover glass of a mobile phone. These sensors detect pressure being applied to the screen. When pressed, this causes colours and lights to change on a separate display.

TOUCH ME

By using a conductive ink with a very low amount of graphene, GNext paints a thin and flexible conductive trace or coating for electronic signal transmission that allows electronic equipment to be turned on and off and controlled. This provides a versatile and low-cost solution to applications in IoT where existing technology is too costly and unreliable.

NIGHT VISION IMAGING

Emberion's novel visible light to shortwave infrared (vis-SWIR) detectors provide excellent combination of value and performance for automotive and surveillance night vision, spectroscopy and machine vision applications. Graphene has superior electronic properties and disruptive broad spectrum imaging modules can be created by integrating it with conventional CMOS.



FLEXIBLE DISPLAYS AND SENSORS

FlexEnable will showcase a variety of demos enabled by flexible electronics including an e-paper display with graphene top pixel, an organic LCD and a flexible fingerprint sensor. By exploiting the flexibility, conductivity and transparency of graphene and the high mobility of other 2D materials, FlexEnable aims to enable active surfaces anywhere and everywhere.

NFC-ANTENNAS

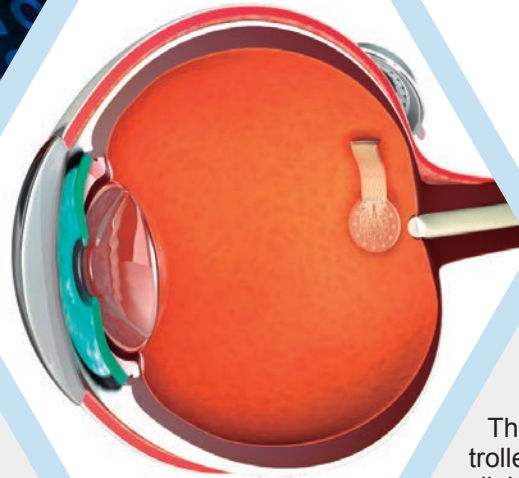
A key target for modern technology is to replace metals with lighter, cheaper and more environmentally friendly materials. CNR-ISOF has realized working near-field communication (NFC) devices with graphene derivatives, replacing the conventional metallic antennas. Graphene NFC devices presented work as electronic keys, flexible tags, smart cards and other typical NFC applications.



WEARABLES AND HEALTH

RETINAL AND NEURAL PROSTHESES

Retinal implants can serve as optical prostheses for blind people whose optical nerves are still intact. In contrast to traditionally used materials, graphene has excellent biocompatibility thanks to its great flexibility and chemical durability. With its outstanding electronic properties, graphene provides an efficient interface for communication between the retina prosthesis and nerve tissue.



ROBOTIC PROSTHETIC HAND

The robotic prosthetic hand is controlled by a wearable sensor made by a cellulosa and graphene composite, developed by IIT. Made in the form of a bracelet, it is comfortable to wear and once placed on the wrist, it transduces the movement of the hand into electrical signals that are used to move the artificial hand in a spectacular way.



FLEXIBLE WELLNESS SENSORS

Graphene enables devices such as optical sensors, NFC/RFID tags, wireless receivers and transmitters, and flexible and transparent biosensors. ICFO is developing a transparent and flexible platform for wellness sensing. The prototype wearable sticker can measure heart rate and blood oxygen saturation. A future health patch measures respiration rate, body temperature and much more.



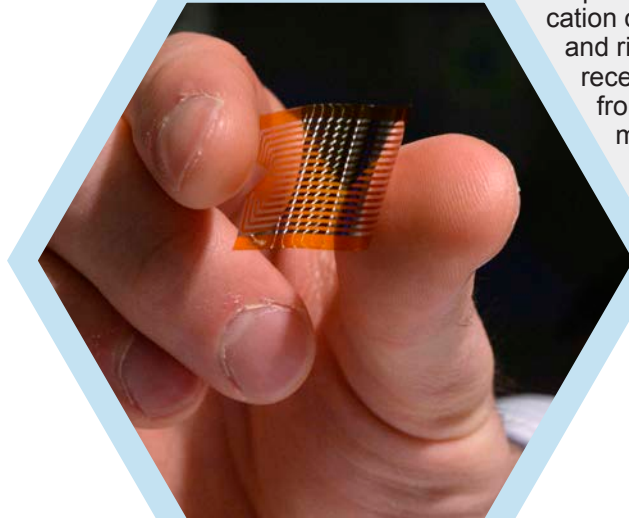
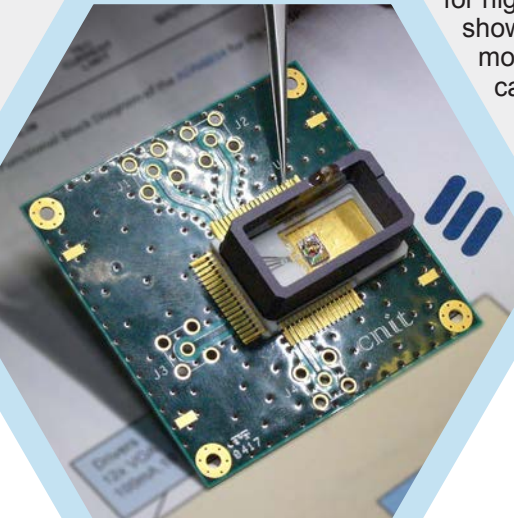
DATACOM

FLEXIBLE WIFI RECEIVER FRONT-END

AMO together with RWTH Aachen University are developing the first flexible WiFi receiver. The underlying Graphene MMIC process enables the fabrication of the Wifi receiver on both flexible and rigid substrates. This flexible WiFi receiver is the first graphene-based front-end receiver for any type of modulated signal.

GRAPHENE PHOTONICS INTEGRATION

CNIT, Ericsson, Nokia and IMEC have developed graphene photonics integration for high speed transmission systems and are showcasing packaged graphene-based modulator operating over several optical telecommunications bands.



COMPOSITES AND PRODUCTION



GRAPHENE SUPERCAR

BAC has unveiled a version of its Mono track car with body panels made from graphene carbon fibre composite, which are lighter and stronger than existing panels. The University of Manchester, Haydale and BAC have been involved in the development of graphene carbon fibre composites used in the creation of the world's first graphene car.

GRAPHENE MOTORCYCLE HELMET

By coating graphene on to the exterior shell, Momodesign and IIT have developed a helmet with improved thermal comfort and safety. The graphene coating allows better distribution of impact force, making the helmet less susceptible to damage compared to helmets without graphene, even in high temperature conditions.



GRAPHENE DRONE

This first demonstration of a drone, whose propeller blades contain graphene is presented by the Universities of Manchester and Central Lancashire. The graphene components show benefits such as light weight, strength and stiffness, but the aim is also to investigate the potential effects of graphene in drag reduction, thermal management and ultimately the ability to achieve lightning strike protection.

GRAPHENE PRODUCTION

Graphenea aims to develop the potential of graphene for electronic systems by means of combining large-scale graphene synthesis and conventional CMOS technology into an industrial compatible process. Graphenea is scaling up graphene production for semiconductor industry, developing the quality control equipment and demonstrating the technology in real devices.

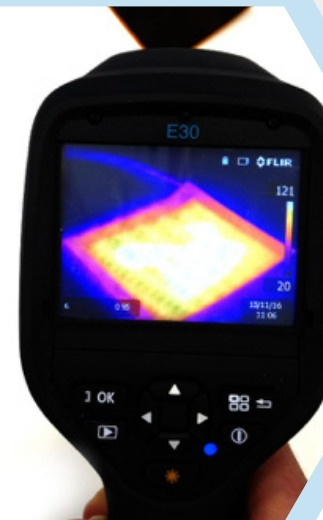
ENERGY

INTERACTIVE HEATING SYSTEM

This novel “spray on” graphene heating system developed by FGV Cambridge Nanosystems provides uniform, large-area heating. To demonstrate the versatility of the heater, it will be integrated into a piece of art, wirelessly controlled via a mobile app. The system can also double as a temperature sensor, where you can control light intensity by sensing body temperature.

GRAPHENE SUPERCAPACITORS AND BATTERIES

Thales, M-SOLV, IIT and the University of Cambridge are developing a new deposition technique to fabricate supercapacitor and battery electrodes based on graphene. Visitors will see electrodes developed with this new technology whose performances can lead to devices that charge very quickly and deliver energy for a long time.





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GRAPHENE FLAGSHIP

GRAPHENE CONNECT WORKSHOP FROM DATACOM TO IOT - ENABLED BY GRAPHENE

THURSDAY 2 MARCH, 9:30-16:00
HALL 8.0 NEXTECH THEATRE F

If you are interested in attending the workshop, please send an email to event@graphene-flagship.eu or talk to Graphene Flagship staff at the Graphene Experience Zone

GRAPHENE EXPERIENCE ZONE

NEXTech Hall 8.0 Stand M33

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MOBILETM
WORLD CONGRESS

BARCELONA **27 FEB - 2 MAR 2017**

Organised by:



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