



Press Release

Real-time bomb scanner to revolutionise airport security

A team of European scientists have created a real-time, hand-held chemical sensor that will increase airport safety, reduce car emissions, and combat unnecessary food wastage.

The device can scan from a distance of up to 30 metres and is capable of instantaneous, real-time, unambiguous detection. Harnessing new photonics technology, the device uses spectroscopic sensors, that read the unique frequencies, or 'signatures' given off when liquids or gasses interact with light.

With real-time scanning delivering a realistic detection rate of one every few seconds, and therefore a rate of 1200 per hour, the new device can deliver over 6 times more capability than state of the art trace portal scanners that detect bombs and illegal drugs at a rate of 180 of passengers per hour.

While the device has many other capabilities, such as the early detection of diseases, scanning for bacteria in fridges or even detecting the presence of alcohol from afar, its stand-off detection capabilities mean the small device could be installed on the front of airports, scanning crowds in real-time for suspicious material, like explosives or illegal drugs, *before* they even entered the building.

The MIRPHAB, or 'Mid-Infrared photonics devices fabrication for chemical sensing and spectroscopic applications' project, is being coordinated by CEA-Leti, France, and has received funding of €13,013,967.39 from the European Commission's Photonics Public Private Partnership under the Horizon 2020 program, and €2,005,280.00 from the Swiss Government.

Project coordinator Sergio Nicoletti says "we are making the next generation of sensors that are compact, low cost and low on power consumption and capable real-time detection where the speed and sensibility is unrivaled. We want to shrink current technology down to the size of a mobile phone".

Jose Pozo, Director of Technology and Innovation, at the European Photonics Industry Consortium (EPIC) says, "Spectroscopic sensing in the MIR wavelength band (3 ÷ 12 µm) is a powerful analytical tool to address societal challenges like climate change or monitoring emission controls."

"In this wavelength band, the so-called "fingerprint region", chemicals exhibit intense adsorption features allowing superior detection capabilities and unambiguous identification", said Pozo.

With links already established in sectors such as health, automotive, medical and domestic, Pozo explains that MIRPPHAB will turn these achievements into business and commercial opportunities for both SMEs and large industrial groups.

"Within MIRPHAB, we have set the ambitious goal of creating a commercially viable pilot line for the fabrication of Mid-IR sensors that is ready for business by 2020. This result will be

achieved by setting up and operating a fabrication platform, offering open access for fast Mid-IR device prototyping to European industry.

“Any European company with a business on analytical sensing can apply. They will receive matching funding to cover the prototyping costs of the MID-IR sensing system of up to €230K. Such a system will be integrated from mature components from our extended library, including laser sources, detectors and micro-optics. Furthermore, the related services to prototyping also include micro assembly and standard reliability studies”, said Pozo.

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About MIRPHAB

The MIRPHAB (Mid InfraRed PHotonics devices fABrication for chemical sensing and spectroscopic applications) consortium will establish a pilot line to serve the growing needs of European industry in the field of analytical micro-sensors. Its main objectives are to

- provide a reliable supply of mid-infrared (MIR) photonic components for companies incl. in particular SMEs already active in analytical MIR sensing
- reduce investment cost to access innovative MIR solutions for companies already active in the field of analytical sensors, but new to MIR photonics based sensing
- attract companies new to the field of analytical sensors, aiming to integrate μ -sensors into their products.

To fulfil those objectives, MIRPHAB is organized as a distributed pilot line formed by leading European industrial suppliers of MIR photonic components, complemented by first class European R&D institutes with processing facilities capable of carrying out pilot line production.

MIRPHAB provides:

- access to MIR photonic devices via mounted/packaged devices for laser-based analytical MIR sensors
- expert design for sensor components to be fabricated in the pilot line plus training services to its customers.

The platform will be organized such that new developments in MIR micro- and integrated optic components and modules can be taken up and incorporated into the MIRPHAB portfolio.

MIRPHAB will work on a convincing scheme for the flow of hardware and information, suitable to operate a distributed pilot line efficiently. MIRPHAB will develop sound business cases and a compelling business plan. Potential cost-performance breakthroughs will be shown for reliable MIR sensing products based on building blocks provided by MIRPHAB. MIRPHAB will become a sustainable source of key components for new and highly competitive MIR sensors, facilitating their effective market introduction and thus significantly strengthening the position and competitiveness of the respective European industry sector.

About Photonics21

Photonics21 is the European Technology Platform (ETP) for photonics –a technology encompassing all of the products and processes around the emission, manipulation and detection of light. It is integral to a wide range of industries that include the medical, healthcare, transport, manufacturing, and telecommunications sectors. In December 2005 "Photonics21" was set up to bring the community of photonics professionals and industries together.

In September 2009, the European Commission defined photonics as one of five European Key Enabling Technologies (KET's) and shortly after the European Research & Innovation Program "Horizon 2020" invited Photonics21 to become a "Public Private Partnership" (PPP). In November 2013 the "Photonics 21 Association", a legal entity under Belgium law, became the private contract partner in a Public Private Partnership (PPP) in conjunction with the EU Commission.

Today Photonics21 represents more than 2600 personal members from all over Europe. Our members are experts in the photonics industry, research organisations and universities who actively engage with us to develop a joint photonics strategy for future research and innovation in Europe.

With the global photonics market growing at twice the world economic growth rate, from 350 Billion Euros in 2011 to 615 Euros in 2020, Photonics21 stands in a secure global market position. The production of European photonics alone accounts for 60 billion Euros and employs over 350,000 people directly.

With strong growth forecast, current industry trends like digitalisation, resource efficiency, individual and zero failure production will drive the photonics industry further.

For more information about Photonics21 please go to

<http://www.photonics21.org/index.php>