Prof. Roel Baets (Ghent University – IMEC) awarded with an ERC Advanced Grant

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The European Research Council (ERC) has awarded prof. Roel Baets with a prestigious Advanced Grant with a budget of around 2.2 million EURO for the research project InSpectra of Ghent University and IMEC. The InSpectra project will combine two technologies (nanophotonic and silicon technologies) to develop analytical devices the size of a chip which could be used for environmental monitoring and medical diagnosis. The Photonics Research Group of professor Roel Baets will develop a chip equipped with tiny lasers. This chip will measure small concentrations of various substances and may include medical and environmental applications.

ERC Advanced Grant

Set up in 2007 by the EU, the European Research Council is the first pan-European funding organisation for frontier research by individual scientists. It aims to stimulate scientific excellence in Europe by encouraging competition for funding between the very best, creative researchers of any nationality and age. The ERC also strives to attract top researchers from anywhere in the world to come to Europe. It funds both senior research leaders ('ERC Advanced Grants') and younger, early-career top researchers ('ERC Starting Grants'). The substantial funding is awarded based on peer review evaluation.
In its latest competition for 'Advanced Grants', the European Research Council (ERC) is awarding some €590 million to 266 established research leaders. The grants will allow them to pursue their innovative, 'blue sky' research throughout Europe. This is the third Advanced Grant call since the ERC was launched in 2007 as a flagship component of the EU's 7th Research Framework Programme. The ERC promotes research at the frontiers of knowledge in all domains (Life Sciences, Social Sciences & Humanities and Physical Sciences & Engineering).
Prof. Roel Baets is the first senior researcher of Ghent University-imec to be awarded an ERC Advanced Grant. From the start of the ERC programme, ten professors of Ghent University have been awarded with an ERC Starting Grant.

InSpectra

The measurement of small concentrations of certain desirable or undesirable substances in air, water, food, human tissue is of great importance in many different applications such as safety, health and environmental monitoring. The optical transmission of a medium whereby this is measured as a function of wavelength (spectroscopy), is one of the main methods for these measurements, as every substance has a characteristic optical absorption signature.

Since the invention of the laser in 1960, spectroscopy based on lasers has gained an enormous boost. This system is used for example to monitor air quality in tunnels. Completely new applications will be possible with the chip InSpectra aims to develop, such as a sensor for carbon monoxide imbedded in a mobile phone or a subcutaneous sensor for continuous glucose monitoring for diabetes patients. To

enable these measurements, the entire spectroscopy system must be very small, inexpensive and use little energy, so it can be powered by a small battery.

The innovative aspect of InSpectra is that the basic silicon-based nanophotonics technology will be used for medical or environmental applications. One of the challenges is to translate existing silicon photonics technology into other wavelength bands. The existing technology is nowadays designed for a wavelength band in the infrared, with wavelengths between 1500 and 1600 nm. This is the main wavelength band used in most fiber optic applications (telecommunication). But to detect various substances, measurements in other wavelengths, such as longer wavelengths (mid-infrared) and shorter wavelengths (visible light or near-infrared), must be carried out.

The InSpectra project fits within the newly founded multidisciplinary research platform NB Photonics (Center for Nano- and Biophotonics), of which Roel Baets is the director.

More information:

- ERC Press release: http://erc.europa.eu/pdf/Press_release_AdG2010_results.pdf
- Photonics Research Group: http://photonics.intec.ugent.be
- Imec: http://www.imec.be
- Center for Nano- and Biophotonics: http://www.nb-photonics.ugent.be