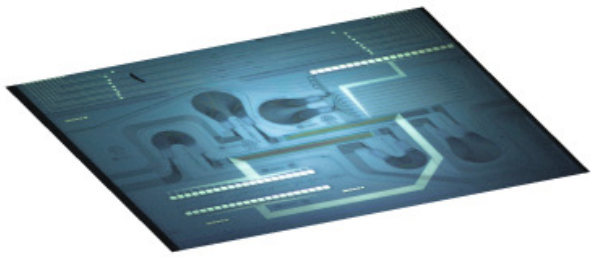
euroPIC

European
manufacturing platform
for Photonic Integrated Circuits



EuroPIC Newsletter

August 2010

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The EuroPIC User Group: offering a head-start for users of PICs!

Introduction

The tremendous expansion of photonic technologies serving a myriad of applications will clearly fuel the drive towards *Photonic Integration*. At the dawn of this new era, the EuroPIC consortium seeks to boost Europe's manufacturing capability in *Photonic Integrated Circuits*, concentrating on development of generic foundry processes for realisation of PICs. This approach allows costs for development of design tools and specific equipment to be are shared by many parties.

One of the strategic approaches within the EuroPIC program is to follow a route by analogy to the success of the current standard for electronic integration techniques. Whereas in the electronic domain integrated complex circuits are composed of active and passive components like transistors, diodes, resistors and capacitors, PICs will be configured using passive and active photonic components like waveguides and optical amplifiers. Additional to the design environment, the generic approach also concentrates on strict manufacturing processes in order to achieve components having a consistent and high performance.

Application examples as reference markers along the EuroPIC project roadmap

To transfer the EuroPIC project results to serve significant market needs and to demonstrate the benefits of photonic integration, a number of PICs for application in a number of specific areas have been selected. These cover applications in fibre- to-the-home networks, high-bit-rate receiver circuits, PICs for structural health monitoring, advanced sensors for health care and contactless high-precision metrology. These 'reference applications' serve two major goals. First, the performance of PICs being designed on the use of generic components and manufactured by generic processes can be evaluated from a technology point, Secondly, the results on realised PICs enable interested potential integrators and users of these PICs to prepare for business opportunities and market introduction. This 'reference' approach is also vital for efficient dissemination of the EuroPIC results via the EuroPIC User Group.

SEVENTH FRAMEWORK PROGRAMME

EuroPIC Grant Agreement Nr. 228839 Research area FP7-NMP-2008-SME-2

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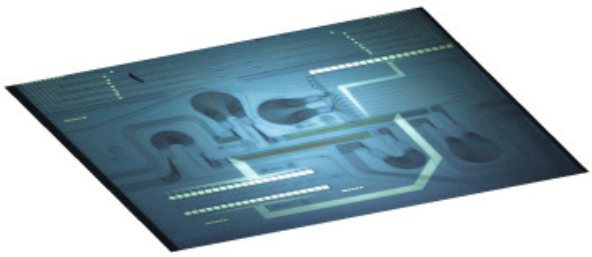

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***EuroPIC User Group*: offering a front-seat position in innovation**

The many results from the EuroPIC project are expected to introduce major breakthroughs in performance and cost of PICs. To tune the foundry technology against the needs of specific, leading edge PIC designs, feedback and input from different groups external to the project consortium is of significant value. Therefore, the EuroPIC project offers unique opportunities to these external parties to contribute to the EuroPIC project. In reward, these *User Group* members can work towards a pole position in the field of PIC-based applications, thereby benefiting from the results of photonic integration in an early stage. Such a concept serves also to intensify interactions between the scientific consortium members and potential users of PICs.

Membership offers many benefits, such as having an *industry voice* to express interest in specific applications for PICs or detailing requirements, thereby enabling expansion of business activities and technology range. It also offers a *front –seat* view on important developments in the field of PICs and unique opportunities to participate in exciting developments. *User Group* membership is free of charge and open to scientific and technical institutes, instrument manufacturers, instrument users, policy-related users such as governmental organizations and even to insurance companies. Specific *User Group* meetings, open to interested parties will concentrate on the input from these parties and serve as feedback to the EuroPIC consortium members. Interaction between the consortium and the users will be policed via a two way NDA specifically designed for this purpose. Our target is to expand the group of potential users to more than 100 at the end of the project.

Strategic route towards pole-positioning of PICs

By analogy with telecommunications development, photonics-based sensing acts as a strong driver for development of advanced PICs. Given the tremendous number of applications for photonic sensors, it is felt that development of sensing-oriented PICs allows (initial) higher costs (compared to PICs for telecoms) to be viable. Such sensing-dedicated PICs can act as an enabling component for large-scale application in e.g. smart structures and skins, medical diagnosis and treatment, extreme accurate metrology, food and drug safety monitoring, environmental monitoring and security applications such as e.g. remote sensing of bio-hazard. For photonics-based sensing the current read-out units mostly are still too expensive, preventing a competitive business case. Furthermore, especially for airborne applications the size and / or weight of the readout units can be an issue, whereas for stand-alone applications the power consumption of the readout unit limits their use. With the successful development of PICs these limitations are relaxed, thereby gearing up the number of applications as illustrated by the figure below.

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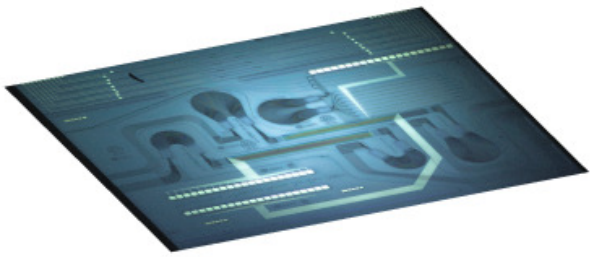

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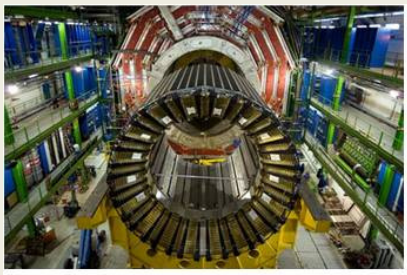
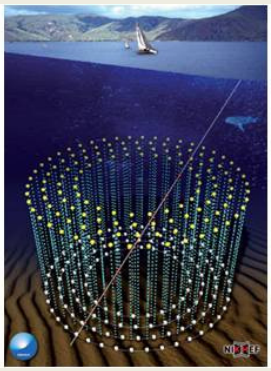


ELEMENTARY PARTICLE RESEARCH
Tens of thousands of detectors… EMC immunity
Direct conversion of the elementary particle interaction (analogue or digital) into the optical domain



DEEP SEA NEUTRINO DETECTOR
320,000 detectors
60Tb/s data to shore over a 100 km photonic backbone

ADVANCED DESIGN AND MONITORING OF INFRASTRUCTURES and CONSTRUCTIONS,
e.g.
Harbours, Bridges, Roads, Tunnels, Pipelines, coastal Regions, River banks…Ships…

The strength of a photonics- based sensor approach is illustrated by the following example, being only one of many. The market for strain sensing is currently dominated by mainly electrical strain gauges and vibrating wire extensometers. As the application of these sensors dictates the use of electrical wiring there is the risk of contamination of the sensor signals by electromagnetic interference. Distributed sensing of strain requires many (shielded) electrical wires, and the mass and size of the cabling grows with the number of sensors. Furthermore, measurement using certain types of electrical sensors is forbidden in explosive environments . In contrast, using Fibre Bragg Gratings for strain sensing reduces the wiring to a single optical fibre transporting the spectrally encoded response of the individual sensors.

Don't miss this unique opportunity - express your interest in becoming a member of the EuroPIC User Group. There is no fee. Fill in the subscription form available at the EuroPIC website www.europic.org
EuroPIC user contact: Mar van der Hoek: mj@vanderhoekphotonics.com

For more information about EuroPIC go to www.europic.org , and for the InP photonics platform JePPIX, go to www.jeppix.eu
JePPIX coordinator: Huub Ambrosius coordinator@jeppix.eu

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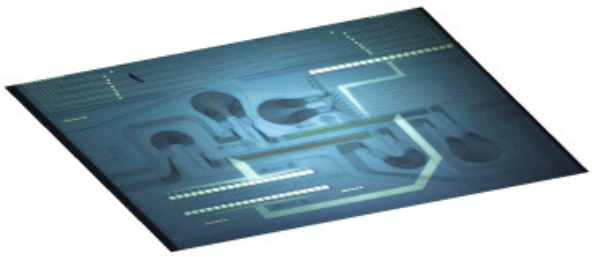

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Announcing a JePPIX/EuroPIC training course in Photonic Integrated Circuit Design
25th of October – 5th of November
Technische Universiteit Eindhoven
Netherlands

The JePPIX training course in InP-based Photonic Integrated Circuit design and fabrication will be run again at Eindhoven this year. The course is also supported by the commercial software house PhoeniX and the EuroPIC consortium. This is a rare opportunity to not only study PIC design with the experts, hands-on experience with various software tools, but also to study practical fab aspects and, ultimately, to get some of your designs built through our shared project runs. More details are to be found on the JePPIX website.

This two week course has proven very popular in the past, and as in previous years there will be the opportunity for you to try out your PIC designs in a shared process run supported by the COBRA facility at TU/e.

The fee (excluding travel and hotel costs) will be € 1000,- .
There is a 50% University discount.

Interested parties should first contact either Huub Ambrosius (JePPIX/Coordinator) or Xaveer Leijtens.

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