Dan de FE2011-thema's van dit jaar. Dit zijn:

- Health Care & Life Science (met dit keer speciale aandacht voor Microscopie)
- Fundamental Research Photonics
- Optical Sensing (nieuw thema)
- Industrial Photonics
- Information & Communication Technology
- Photonics in Daily Life
- Solar (nieuw thema)
- Lighting & LED's (nieuw thema)

Graag maak ik hier van de gelegenheid gebruik om de FE2011-programmacommissie aan u voor te stellen ingedeeld naar thema:

Maurice Aalders, AMC	Dick Sterenborg, Erasmus MC
Danaë Delbeke, Universiteit Gent	Kerstin Wörhoff, Universiteit Twente
Danaë Delbeke, Universiteit Gent	Bart Snijders, TNO
Rufus Fraanje, TU Delft	Michel Verhaegen, TU Delft
Roeland Nuijts, SURFnet	Huug de Waardt, TU/e
Benno Oderkerk, Avantes	Willem Hoving, XIO Photonics
Bart Snijders, TNO	Kerstin Wörhoff, Universiteit Twente
Marten Sikkens, Philips Research	Jean Schleipen, Philips Research

Daarnaast zijn er drie aparte sessies toegespitst op de volgende onderwerpen:

Memphis project	o.l.v. Bart Verbeek, voorzitter Memphis project
Packaging & Assembly	o.l.v. Willem Hoving, XIOPhotonics
IOP Photonics Devices	o.l.v. Bart Verbeek, voorzitter IOP PD

Ook is het FE2011 verder uitgebreid met een aantal nieuwe activiteiten, waaronder de volgende workshops:

Workshop Computer Vision	Jaap van de Loosdrecht, NHL Hogeschool
Workshop Imaging Optics J	Jean Schleipen, Philips Research
Workshop Illumination Optics	Marten Sikkens, Philips Lighting
Workshop Fibre Optic Sensing	Guus Taminiau, FOSNE-platform

Kortom een programma waarbij je als bezoeker je vingers aan kunt aflikken. Voor alle verdere details verwijs ik graag naar de website van het Fotonica Evenement **www.fotonica-evenement.nl**. Zo kunt u na ook na afloop van het evenement hier op uw gemak nog eens alle presentaties inzien.

Brokerage Event 2011

Nieuw is ook het internationale Brokerage Event. Deze activiteit is opgezet in nauwe samenwerking met Syntens. Liever gezegd, Syntens (René de Groot en Eileen Ridders) heeft het meeste werk verricht, en Mikrocentrum en PCN heeft Syntens daarbij zoveel mogelijk proberen te ondersteunen. We zien het FE2011 als startschot om in de toekomst deze activiteit ook op continue basis, dus niet alleen beperkt tot het Fotonica Evenement verder te ontwikkelen.

Tenslotte

Samen met Agentschap NL, Mikrocentrum, PCN, de programma commissie, en de deelnemende bedrijven aan de Kennisexpo en de Workshops, zijn wij ervan overtuigd dat we voor u als bezoeker weer een mooi programma hebben kunnen samenstellen, en met veel nieuwe onderwerpen. U kunt bijdragen aan dit succes door in groten getale deel te nemen aan dit voor de Benelux unieke evenement. Ellen en ik hopen in ieder geval dat we het aantal van 550 bezoekers weer ruimschoots gaan overtreffen.

Mede namens Ellen, wij ontmoeten u graag op 29 of 30 maart 2011 te Nieuwegein!

The Brussels Photonics Team at Vrije Universiteit Brussel and its pioneering contributions to a durable biotope for photonics innovation in Europe

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° Technology Enterprise Team
Vrije Universiteit Brussel, Pleinlaan 2, Brussel, België

1. Smart innovation is key

On February 24, 2011 Neelie Kroes, Vice President of the European Commission responsible for the Digital Agenda, addressed for the first time the broader community of Photonics 21, a European voluntary association and technology platform of industrial enterprises and academic stakeholders in the field of photonics. In her speech entitled "A European Strategy for Research and Innovation in Photonics" Commissioner Kroes explained how important the innovation of small and medium sized enterprises (SMEs) is to European photonics. She underlined that high tech SMEs are key drivers of innovation in Europe, expressed her strong beliefs in the role of youngsters in innovation, and highlighted the fact that today's youngsters will be the entrepreneurs of tomorrow. She also stated that policy changes have started with the ambition to create the conditions for smart growth in Europe. At the same time she emphasized that to succeed in this goal it is not enough to do excellent research but that we need to create a market which is friendlier to innovation. To conclude she called for concrete actions addressing the whole research and innovation chain, in particular paying attention to bridging and closing the gap between know-how and innovation.
The key-messages from Europe for ICT in general and for photonics in particular are therefore very clear: focus on research and innovation that address the big societal challenges and that serves the daily needs of the people; accelerate the entrepreneurial capacity and innovativeness of high tech SMEs in Europe to drive industrial leadership and competitiveness in Europe; and motivate and train youngsters to participate in the whole innovation chain, so that they can become the future entrepreneurs.

In this article we would like to showcase three very recent pilot projects of the Brussels Photonics Team B-Phot (B-Phot) at Vrije Universiteit Brussel (VUB) that could be considered as pioneering contributions to help creating and supporting such durable biotope for photonics innovation in Europe.
A first pilot project concerns a successful initiative of Prof. Marc Goldchstein in collaboration with the Faculty of Engineering of the VUB to introduce entrepreneurship, and entrepreneurship in photonics in particular, in the academic engineering curriculum.
A second pilot project, that has recently started, targets the testing of a new European subsidy model to lower the barriers for photonics-driven product innovation in Europe. It concerns the creation of the European virtual technology platform ACTMOST as single-stop-shop solutions provider to support SMEs and large companies in their efforts to innovate with photonics technologies. The main goal is

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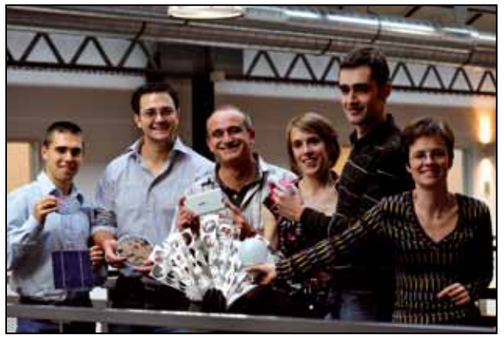
to provide fast, easy and investment-free access to photonics expertise and photonics top-technology to speed up the time-to-market of innovative products.
We conclude with a third and last example that focuses on the development of an intra-curricular educational kit to excite, engage, and educate youngsters in a durable way in the domain of photonics so that, through hands-on-experience in the classrooms, they get a taste of the opportunities that photonics can bring for them if they want to personally and substantially contribute to our present-day societal challenges.
Our hope with this article is that the illustrative examples which we bring forward will lead to new inspiration as well as to new joint initiatives to support smart innovation in Europe.



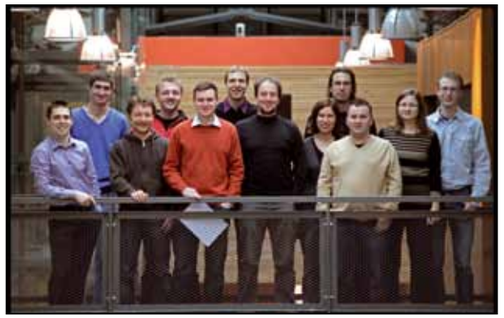
The Technology Enterprise Team, from left to right: Tom Guldemont (photonics), Kevin Douven (micro-electronics), Marc Goldchstein (project leader, software), Leen Lauwers (innovation in ma-terials), Thomas Crispeels (biotechnology). Professor Ilse Scheerlinck is currently developing the domain of sustainable energy.
Photo: Bernadette Mergaerts

2. Technological entrepreneurs and entrepreneurial technologists

Over the last years the Vrije Universiteit Brussel has developed an encompassing educational program on technology entrepreneurship, with a special focus on photonics.
Translating technological innovation into entrepreneurial activity remains a key challenge for Europe. This is especially so for Belgium, holder of the world record for the lowest level of entrepreneurial activity[1]. Research[2] shows that the level of entrepreneurship is dependent on elements which can be influenced by education.
In 2007 the VUB decided to address this challenge and develop an encompassing educational program. The project 'Technology Entrepreneurship at the VUB' (TE) developed an educational package for students from different directions: Engineering, Sciences and Business. Sponsors from the private sector[3] together with the Flemish Government ('bridge-projects economy-education') provided initial funding.
Today the project is funded by the VUB. The project is driven by Marc Goldchstein, Educational Professor Technology Entrepreneurship and his TE team.

Cross-fertilization between Business and Science/engineering curricula
For Business students (Handelsingenieur) the program starts early: they receive a course 'technology entrepreneurship' (6ECTS) in their first Bachelor year. In the following years they follow a series of science courses which prepare them for the technology domains covered in the Master years. One of these courses is 'Electricity, Electronics and Photonics'. In the Master years the business engineering students focus on one of four key enabling technologies[4]: they follow a technology course taught by professors from the science and engineering faculties. One of these courses is 'Technology and Applications of Photonics and Microelectronics', taught a/o by Prof. Thienpont.
For Master students in science and technology (engineering, bio-engineering, computer sciences, physics...) a course entitled 'Introduction to Business' is offered. This 33 hour course initiates students to key aspects of business, such as ecosystems and strategy, finance, HR, marketing, legal aspects. This course is compulsory a/o for photonics engineering students, while it is an elective course to all others. We can note a high degree of interest in the course, as more than twenty percent of Engineering Master students (1st + 2nd year) opted for the course this year only.
Next, for both engineering and business students, we offer a series of 4 courses on the 'business aspects of...' specific technological sectors: photonics and microelectronics is one of them[5]. The TE team members develop these courses; guest speakers from industry contribute to classes. In the second Master year business students follow a mandatory advanced course on entrepreneurship, also open to engineering students.

Putting it all into practice...
Classes alone cannot cover some essential dimensions of entrepreneurship, such as coping with novelty and uncertainty, entrepreneurial passion and commitment, team dynamics, and interdisciplinarity. For these topics we engage students in real business development projects around innovations emanating straight from the research labs of the VUB. At the start of each academic year the TE team organizes a Project Fair. On this matchmaking event VUB researchers present their innovation and the requested business development work to Master students in business and science/engineering. Students subscribe to one of the projects and work during a full academic year on these business development tasks, as part of their academic curriculum (6ECTS). Over the last three years some 100 students of different backgrounds have performed



Participants of the Intensive Training 2011

business development activities on more than 20 projects, most often in mixed business/engineering teams. The students are coached by the TE team members.
Photonics has been a key focus domain of the TE project since its inception for several reasons. The importance of photonics as Key Enabling Technology for the European Industry in the 21st century is known to the reader. Another major argument is the strength of the VUB research (team) in photonics under the direction of Hugo Thienpont. His proactive support to the project was essential in its success. The range of VUB educational programs in photonics (Dutch and English Bachelor/Master programs, Erasmus Mundus) created the context in which the educational programs on Technology Entrepreneurship could be deployed. Many of B-PHOTs industry partners (BEST, Barco, Tyco Electronics, FOS&S...) actively contribute to the educational initiatives and courses. The TE team also offers these educational programs to the

	Generisch	Biotech & life sciences	Photonics & microelectronics	Innovation in materials	Sustainable energy
1ste Bachelor	Technologisch ondernemerschap 6SP				
2de Bachelor	Ingenieurstechnieken en -processen 3SP	Chemie 3SP			
3de Bachelor		Basisconcepten en -processen van de biologie 3SP	**Elektriciteit, elektronica en fotonica 6SP Goossens/ Thienpont**	Mechanica van de materialen 3SP	
1ste Master		Biotechnology 6SP	**Technology and applications of micro-electronics and photonics 6SP Stiens/Thienpont**	Materiaalkunde en -innovatie 6SP	Sustainable Energy 6SP
2de Master	Entrepreneurship and business aspects of technology 3SP theory + 3SP 'business aspects of...', choice between:				
	Software	Biotechnology	**Micro-electronics and photonics**	Innovation in materials	(Sustainable energy)
		Technological business development projects 6SP			
		verplicht	Keuze: 1 uit 4 technologie OO's	Keuze: 1 uit 3 praktijk OO's	

Table 1: Technology entrepreneurship in VUB Business Engineering curriculum

[1] *see Global Entrepreneurship Monitor reports 2002-2009*
[2] *GEM studie Vlaanderen en België 2008 Impact ondernemerschapsonderwijs*
[3] *Amgen, Bank De Groof, Bekaert, Ethias, Fundus, IBM, PMV, SIRRIS, Solvay, Tyco Electronics*
[4] *photonics and microelectronics; biotechnology; materials; and sustainable energy*
[5] *next to biotechnology, innovation in materials and software*

Professor Francis Berghmans presents his project in detail during the break-out session of the Project Fair

wider public. The annual Starter Seminars, targeted at VUB personnel and the wider public, attracts yearly more than fifty participants to its 33 hour program. To date, two 10-day courses 'Intensive Training Entrepreneurship in Photonics' (see article in the insert) and three 'Intensive Courses Business & Biotechnology' have been organized.
The educational program on technology entrepreneurship has tangible impact. Research[6] indicates that the intention towards entrepreneurship of the students has increased significantly after participating in the program. The attitude towards entrepreneurship and perceived behavioral control also increased significantly. We believe such educational programs can have a long lasting and structural impact on entrepreneurial mindsets.

Intensive Training "Entrepreneurship in Photonics" a real success!
The second "Entrepreneurship in Photonics" training, held at the Vrije Universiteit Brussel from January 17 until January 28, 2011 was a joint effort of the Brussels Photonics Team in close colla-boration with the Technology Entrepreneurship Team of the department of "Business Economics and Strategic Management". The training program consisted of three modules.

The 1st module, "Introduction to Business Economics", a 3 days course, covered an introduction to a wide range of disciplines related to business economics and high-tech entrepreneurship, including financial management and venture capital, understanding the structure and dynamics of industrial sectors, intellectual property rights, marketing and human resource aspects.

The 2nd module, "Business Aspects of Photonics", a 4 days course, provided an overview of the photonics markets and the typical business aspects associated with these markets. Also, several business cases and testimonials from photonics entrepreneurs and professionals were included in the program. Key people from companies such as Philips, Barco, Optrima, Trinean and FOS&S shared their experiences and explained how they developed their company through the years. A visit to the optical sorting company BEST was part of the program.

The 3rd and final module was called "Starting a Technology Venture". In this 2 days course the em-phasis was placed on different aspects related to starting up a technology venture: IP strategies and financial planning, understanding how potential investors will look at a financial or business plan, and which elements they will raise in a negotiation. In addition the trainees had the opportunity to present their project to two seasoned Venture Capitalists.

The Training was attended by 15 young researchers, coming from all over Europe: Germany, The Netherlands, Belgium, Spain and Russia. Thanks to the support of Photonics4Life, 10 young re-searchers, representing KIT, VUB, MESA+, IPHT and Saratov State University, had the opportuni-ty to increase their knowledge about business economics and setting up a high tech company. The 1st module was followed by 11 persons, the 2nd module attracted 12 researchers and the 3rd and final module could count on the interest of 9 participants.

Thanks to the feedback of the participants of last year, the organization was able to optimize the content of the Intensive Training resulting in very high evaluation scores. The third edition of the training will take place in the first half of 2012. If you are interested in participating, please send an e-mail to Tom Guldemont at tguldemo@b-phot.org

[6] *Research on impact of "Technology Entrepreneurship" VUB educational program on the entrepreneurial intentions of the target group', Thomas Crispeels & Jaap Baarends, 2011*

3. ACTMOST: Pioneering a new subsidy model to support photonics industrial innovation in Europe
Photonics exploits the unique properties of light to produce durable, energy friendly, innovative products that improve the quality of our lives. Today already photonic components find widespread applications in the domain of information and communication technology. Optical fibers for example form the backbone of our high-speed internet while photonic components are vital parts in displays, projectors, DVDs, digital cameras, laser scanners and printers. Photonic technologies recently also penetrated the renewable energy sector with solar cells and highly-efficient LED-based lighting that will soon replace the classic light bulb. Currently photonics is conquering the safety and security market with low-cost night vision systems, optical fingerprint sensors and retinal scanners. Market forecasts also predict a bright future for photonics in the medical world with new minimally-invasive optical diagnostic tools and with micro-photonic chips for health monitoring. (Information on the photonics market in Europe and in the world can be found in the text box).

The European Commission recently identified photonics as a Key Enabling Technology for the 21st century with a great potential for product innovation. Meanwhile the design, fabrication, integration, and testing of cutting-edge photonic components remains very complex and photonic technology platforms that enable this innovation are not always easily or directly accessible for industry.
Technology-driven innovation indeed requires top-experts and expensive technology supply chains to turn novel concepts into practical and manufacturable products. Companies however — and in particular SMEs — often do not have direct access to such infrastructure. In addition the highly-skilled people that can operate these technology platforms are hard to find. In such cases high-technology becomes a show-stopper rather than a catalyst for product innovation and economic growth.

To overcome this hurdle and to lower the barriers for photonics-driven product innovation in Europe B-PHOT initiated the European consortium "ACTMOST" with the aim to test a new industry support model with financial aid from the European Commission. "ACTMOST" stands for Access Centre To Micro-Optics Expertise, Services and Technologies. It is a European consortium of 14 high-tech research laboratories from 6 European member states that enables companies —and in particular SMEs — to access their top-level technology platforms and experts in no time, at no cost, and risk-free.
In September 2010 the European ACTMOST partners joined forces and created a unique "one-stop-shop" solutions provider for micro-photonic technologies. Their main goal is to pro-actively provide European companies with timely, cost-effective, and investment-free access to professional, cutting-edge micro-photonic technologies and knowledge to support the development of new products. The technology support that ACTMOST can provide encompasses the entire food-chain of micro-photonics: from optical design, to measurement, prototyping, replication and packaging, all the way to proof-of-concept demonstration, prototyping, reliability testing, and pre-production level fabrication. ACTMOST aims at providing complete solutions for companies through focused collaborations and through hands-on training of industry staff in the highly advanced laboratories of the ACTMOST technology partners.

Important to remark is that the support which ACTMOST provides to industry is ñunder certain conditions and up to a certain level- financially fully subsidized by the European Commission. With this cost-efficient and risk free support ACTMOST aim at lowering the barriers for industry to start validating micro-photonic solutions for product innovation. ACTMOST will be a major driving force to sustainably support European industry in keeping a leading position in micro-optic and micro-photonic enhanced products, strengthening the competitiveness of Europe and creating new jobs. With the 1.2 Million Euro funding ACTMOST received from the European Commission it targets to serve more than 30 companies during a first test-phase. ACTMOST has started serving European companies from January 2011 onward. The first feedback from industry is overwhelmingly positive and points out that the initiative closely matches the real needs of European SMEs and large companies to substantially decrease the "time-to-market": a single entry and contact point, immediate response,

*** Photonics Market in Europe and the world**

According to the European Technology Platform "Photonics 21" that represents the European photonics industry, research institutions, and universities, the global photonics market in 2008 was estimated to be around € 270 billion, of which Europe took € 55 billion. This corresponds to a share of more than 20% of the worldwide production volume in the photonics industry. In Europe more than 5000 companies are involved in photonics, most of them SMEs. The core sectors are lighting, production technology, medical technology, defense photonics and optical components and systems with market shares ranging from 25 to 45 %. Photonics companies themselves employ about 290.000 people in Europe.

Supporting innovation-driven companies with photonics expertise and technology support to speed up their time-to-market is ACTMOST's prime target.

no administration and simple procedures, professional support from researchers with industrial savvy, fast access to top level facilities, practical solutions and manufacturable innovations, investment-free proof-of-concept demonstrations within three to six months, and opportunities for follow-up projects to bring the product to market.

Information on how to access ACTMOST's technology support and services can be found on www.actmost.eu

4. "Photonics Explorer" - a kit with a difference!

The Photonics Explorer is an intra-curricular educational kit which aims to bring the fascination of working with light to classrooms across Europe — to engage, excite and educate secondary school students. It is being developed by a team of scientists at B-Phot working with an Educational Advisory Panel of over 35 teachers and science education professors from 10 European countries.

The kit is designed to augment and complement the teaching and learning of photonics at secondary schools. Unlike extra-curricular outreach events that grasp the attention of students momentarily, the Photonics Explorer aims to achieve a lasting, pan-European impact by integrating seamlessly into existing European school curricula.

The kit contains class-sets of up-to date, industry sponsored components, which will be provided to secondary school teachers completely free of charge, in conjunction with teacher training courses. The material is supported by a comprehensive didactic framework developed and targeted at two student age group, 12-14 and 16-18 years. These groups have been identified after a comprehensive study of the European secondary school curricula which indicated that maximum impact could be achieved by raising interest first when optics is introduced in the lower secondary level and again when more difficult concepts are taught at higher secondary level and students are closer to making their career choices.

The kit is laid out in a modular structure, with 8 topics (modules) within secondary school level optics chosen by teachers. Each module contains worksheets for the students describing possible hands-on experiments using the provided material and factsheets with the important facts (given at the end of the lesson to avoid incessant note taking). A teacher guide is included that addresses the learning outcomes from that module, suggests a possible lesson outline and contains comprehensive background information and answers to possible questions that the students might ask. This ensures that the teacher is secure in their knowledge of the topic and confident in teaching it to the students. The components provided are versatile, robust and generic making them useful in various experiments, even outside of the selected topics.

Thus, the material is, in fact, developed 'by teachers, for teachers and students' thus ensuring its relevance, feasibility and usability in the classroom. The didactic framework is flexible enough that it can be adapted by teachers to suit their teaching styles and their particular classroom situation.

The didactic framework is devised such that students are led through experiments using a guided-inquiry based approach. They have the necessary material to work hands-on, in groups of 2-3, designing their experiments, making observations and deriving conclusions. This intrinsic thinking process develops and hones students' scientific and analytical proficiency, encourages creative thinking and teamwork and gives them a feel for handling components and working in a laboratory — essential skills when looking to pursue a scientific career!

The impact of the kit in enhancing the learning of photonics will also be qualitatively and quantitatively measured by partners at the IPN - Leibniz-Institut für die Pädagogik der Naturwissenschaften und Mathematik an der Universität Kiel.

The development of the kit is funded by the European Commission and the Photonics Explorer is supported by the European photonics industry as well as a Strategic Advisory Board consisting of 10 members who constitute the key stakeholders in European Photonics.

The Photonics Explorer will be translated into 7 European languages and tested in 50 schools across Europe between September — December 2011. Following this, the kit will be available to all interested teachers through a non-profit organisation — EYEST (Exciting Youth for Engineering, Science and Technology).

Information on the Photonics Explorer kit and the European project EXPEKT can be found on http://www.photonicsexplorer.eu

The Photonics Explorer is an intra-curricular educational kit that aims at exciting, engaging, and educating secondary school students through hands-on experience in the class-room.