



SATW Transferkolleg

Growth market photonics

Photonics has a tremendous influence on our daily lives. With its Transferkolleg 2008, the SATW contributed in a concrete manner to helping Switzerland retain its good position in this field of technology.

Photonics is the technology making it possible to transform electricity into light and light into electricity. It relies on the close interaction of photons (light) and electrons (electronics) in certain specific materials. Photonics forms the basis for lasers, which today are used for data transmission and storage (blue-ray), medical treatments, as well as cutting and welding metal. Photonics also underlies flat screens, LED lighting and photovoltaics.

A strong position in Europe

The origins of photonics go back to the 1960s, when the laser was invented. With the development of the commercially exploitable laser diode and the fibreglass cable, photonics was given a strong boost, especially in the fields of telecommunications and optical CDs and DVDs. While the burst of the telecom and dotcom bubble in 2001 also put a damper on photonics,

other fields subsequently gained in importance. Measurement technology, medical treatment, materials processing and entertainment electronics are simply not conceivable anymore without the use of laser light. These past years, photonics has also made considerable progress in the field of flat screens, LED lighting and photovoltaics, contributing to the improvement of our standard of living. In Switzerland, where materials processing using laser beams looks back on a long tradition, photonics plays a particularly important role. The local industry generates the second-highest turnover per capita in Europe and strongly contributes to Switzerland as a workplace. However, adequate research support is needed in order for the sector to be able to keep pace with foreign competition – and that not only in the field of academia, but also in the field of applied research. This background

explains why last year's SATW Transferkolleg was already the second one devoted to the topic of photonics.

A tried and tested concept

The initiative met with great interest from industry, as reported by Christoph Harder, Project Manager for the Transferkolleg 2008 (see interview p. 3). The concept of the Transferkolleg once more proved itself: the initiative triggers a brainstorming process which contributes to projects on the cusp of maturity being taken up. The exchange of knowledge between academia and industry is viewed by participants as a particularly fruitful aspect of the scheme. Project teams hence usually pair a university researcher and a product developer to jointly work on an idea. The Transferkolleg does not support actual development and implementation; rather, with a financial contribution, it helps participants concretise their ideas and assess their feasibility.

Swiss industry must be given equal opportunities

Interview with Christoph Harder,
Project Manager SATW Transfer-
kolleg 2008



Swiss industry must be given equal opportunities

Switzerland must make an effort if it is to maintain its leading position in the field of photonics. Christoph Harder, Project Manager of the SATW Transferkolleg 2008, is convinced of the necessity of clear structures for the promotion of research, giving Swiss industry opportunities equal to those already enjoyed by its international competitors.

Mr Harder, after the Transferkolleg 2006, last year the SATW once again devoted a Transferkolleg to the topic of photonics. Why?

The Transferkolleg 2006, «Applied Photonics», focussed on telecommunications. By contrast, last year's Transferkolleg, «Industrial Photonics», was aimed more broadly. There are good reasons why the SATW is applying itself to this field: photonics plays an important role in Swiss industry. Our country generates a turnover of more than 3 billion Swiss Francs per year in this field. It is a little-known fact that the Swiss photonics industry ranks second in Europe. As regards materials processing using laser beams, Switzerland even accounts for 36% of European turnover.

And how is the industry equipped for the challenges ahead?

Unfortunately not optimally. What is lacking in our view is the consequent implementation of the latest technologies. We are missing the necessary long-term collaboration between academia and industry. We must make efforts to this end in order not to fall behind international competition. Switzerland lacks a national strategy for the promo-

tion of research. Naturally, Swiss institutions may also participate in EU programmes, but those are not geared towards the specific needs of our industry. With the SATW Transferkolleg, we seek to remedy this shortcoming. As regards the promotion of research, Swiss industry is at a disadvantage, because the CTI only allocates its funds very restrictively. Small and medium-sized Swiss companies are not given opportunities equal to those of their foreign competitors.

«We were already able to generate first CTI projects.»

How many companies took part in the Transferkolleg 2008?

In the beginning, we had 28 project entries. We selected 15 of these with a view to supervision, providing coaching at a two-day workshop as well as a financial contribution of 16 000 Swiss Francs each. 6 project ideas were so good that we were able to forward them straight to the CTI. Overall, the results are thus highly positive.

Is there room for improvement as regards certain aspects?

The Transferkolleg is particularly effective in bringing together people who would otherwise not have met. It would be ideal to be able to organise a Transferkolleg devoted to the same topic every two to three years, allowing a certain strategy to emerge over time – even though clearly the Transferkolleg cannot trigger a national research strategy.

And now?

This spring, we will carry out a follow-up workshop in Engelberg. We will organise projects along three axes: «Tools» will address the development of laser beam tools, «Manufacturing» processes such as cutting, machining or welding using light, and «Life Science» mainly pharmaceutical applications. Our efforts are supported by the association Swisslaser (www.swisslaser.net), which we founded with the aim of strengthening the Swiss photonics industry and representing its specific interests.

Synthetic biology

Workshop with acatech

The Committee on Applied Biosciences and the German Academy of Science and Engineering (acatech) organised a joint workshop on synthetic biology on 21 January 2009. In Basle, experts discussed the latest research findings, applications and ELSI issues of this still young discipline. Researchers gave different definitions of synthetic biology and first research findings. Industry representatives explained the great commercial potential of different applications and processes. Ethical implications were touched upon as well as critical points in scientific communication. Working groups devised recommendations as to how synthetic biology could emphasise its relevance. In this context, aspects raised included standardisation, biosafety, risk research and the launch of a dialogue with the broad public. Further activities are planned in this field.

ELSI = Ethical, Legal and Social Impact

eGovernance and eEducation

ICT workshops

The SATW's ICT Committee has long been concerned with the challenges, opportunities and risks of the information society. It organised the workshops «Governance versus eGovernance?» (in November 2008) and «ICT and school organisation» (in December 2008). The findings and documentation of both workshops are available on the ICT website.

www.satw.ch/organisation/kommissionen/ict/aktivitaeten

SATW Transferkolleg 2009

Food Processing

Another Transferkolleg will be carried out this year, this time focussing on the topic of «Food Processing». With the Transferkolleg, the SATW and the CTI aim to encourage the exchange of knowledge between academia and industry, as well as to bring to the fore at an early stage those research findings with market potential. Specialists from the fields of science and industry are invited to submit according projects by 31 July 2009.

www.satw.ch/taetigkeiten/projekte/index_EN

Ethics Conference

Teaching ethics at universities of applied sciences

Around 30 participants drawn from the fields of technical colleges, universities, politics and the media took part in the first Ethics Conference in Yverdon, exchanging ideas as to how ethical thinking and acting should be taught at universities of applied sciences. The corresponding report is available on the SATW website. Another event is planned for 2009.

www.satw.ch/organisation/kommissionen/ethik/aktivitaeten/Ethiktagung.pdf

Encouraging young talent

Communicating with youngsters

In 2009, the SATW will increase its efforts to nurture young people's understanding of and interest in technology. It will carry out at least four TecDays in secondary schools, update the youth magazine

Technoscope and develop the area of technology on the youth website Simply-Science.

Last year revealed a deep need to coordinate activities aiming to nurture the emergence of young engineering talent. A coordination workshop is thus also planned for this year.

www.satw.ch/nachwuchs

www.satw.ch/publikationen/technoscope/index

www.simplyscience.ch

SATW Secretariat

New collaborators

Birgit Tönz and Franziska Keller have left the SATW Secretariat, respectively in October 2008 and in February 2009. Peter Ferloni is newly in charge of event management, and Georg von Arx of assisting our expert committees.

www.satw.ch/organisation/geschaeftsstelle/index_EN

Swiss Academies of Arts and Sciences

New President

In January 2009, Professor Peter Suter took over from Professor René Dändliker as President of the Swiss Academies of Arts and Sciences. Professor Suter has been President of the Swiss Academy of Medical Sciences since 2004.

www.swiss-academies.ch/index.php

TecDays

Science? Technology? Of course!



TecDay@KantiBaden www.satw.ch/veranstaltungen/zurueckliegende/TecDayKantiBaden



TecDay@KME www.satw.ch/veranstaltungen/zurueckliegende/TecDayKME

What is the impact of climate change on natural hazards? Who decides how much I pay when refuelling? Why can we ride a bike? Nuclear waste – what to do with it? These are some of the questions looked into by over 800 secondary school pupils during the TecDay@KantiBaden. Amongst 62 different topics on offer, they could select their favourite five, of which they were assigned three. «The world in 50 years», «Biological research into matters of life and death», «Mobile phone radiation», «MP3», «In the eye of the consumer» and «Nanomedicine» were the most popular modules.

400 pupils at the Kantonale Maturitätsschule für Erwachsene in Zurich were also able to experience a TecDay. Modules display strong practical relevance. Some also include experiments and models. Yet it is the exchange with personalities drawn from the fields of industry, academia and research institutes which takes centre stage.

Other schools would also like to carry out a TecDay. For 2009, the SATW has already confirmed events in Solothurn, Liestal, Reussbühl and Aarau. In the years ahead, given financial support from partners, the SATW would like to further develop the TecDays scheme.

SATW

Schweizerische Akademie der Technischen Wissenschaften
Académie suisse des sciences techniques
Accademia svizzera delle scienze tecniche
Swiss Academy of Engineering Sciences



Member of the
Swiss Academies of Arts and Sciences

Agenda

SATW General Assembly

2 April 2009, Berne

TecDay@kssso

3 April 2009, Solothurn

TecDay@GymLiestal

4 June 2009, Liestal

Journées de réflexion

16/17 June 2009, Lucerne

Further information

www.satw.ch

Awards

Swiss Award 2008

Category «Society»

Dr h.c. Giovanni Lombardi,
SATW individual member

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