

Views

Leverage photonics with efficient partnerships between science and industry

At the occasion of SPIE Photonics Europe 2012 (Figure 1), honorary chair Hugo Thienpont gave an interview to Advanced Optical Technologies. He is not only the mastermind of this most important European photonics conference but also the founder of a new European project for efficient technology transfer between science and industry – ActMost. He demands a better communication between the parties and a paradigm shift towards a higher recognition of knowledge transfer. The interview was conducted by Andreas Thoß, publisher of *Advanced Optical Technologies* (AOT).

AOT: You've been organizing the SPIE Photonics Europe Conferences for several years. When did you actually start with it?

Thienpont: We started in 2003 in Brugge here in Belgium. SPIE wanted to return to Europe after they stopped their EurOpto meetings several years before. As an international society they wanted to renew their impact in Europe with respect to photonics again. I got the invitation to help organize a conference called Photonics Fabrication Europe.

From the very beginning I discussed with SPIE about a particular European approach. You have to organize the symposium the European way if you want to be successful in Europe. Human factors like culture, nice receptions, excellent networking are necessary, instead of a more dedicated marketing and sales approach.

AOT: Yes.

Thienpont: We started in 2003 and it was immediately a great success. The conference began with plenary speakers on hot topics in photonics, a concept that we still have today. There were about 700 to 750 attendees, which was already remarkable in those days. Accordingly, the decision was made to try to scale this concept up in 2004. There was an idea to duplicate Photonics West. But that was not straightforwardly possible. You have to grow the symposium organically with emphasis on its European character. We focus on photonics in Europe and innovation in Europe. Of course at the same time it's also our attempt to reach out to the entire community. To the global community, worldwide, including scientists and engineers from Asia and America while giving the conference a clear European flavor.

AOT: As I remember, you then moved to Strasbourg?

Thienpont: Yes. In 2004 SPIE was looking for a great place with European visibility to organize the first full-fledged Photonics Europe. And in 2004, we chose Strasbourg because Brussels did not have a large enough conference location at that time. We reached a level of about 1200 attendees. In 2006 and in

2008 we grew by another 15%. In 2008 we knew we used all the available capacity of the conference center in Strasbourg, so we had to look for a new venue. It was at that time that the new SQUARE conference center, here in Brussels was built, and SPIE decided to move from Strasbourg to Brussels, also because it's much easier to commute to.

AOT: Yes. Definitely. Even in times of volcano ashes over Europe, as I remember the 2010 conference...

Thienpont: Oh yes! The eruption of the volcano, at the end of the symposium, forced several hundreds of people to stay in Brussels for another week. It gave them the opportunity to discover the city and have a great time. Photonics Europe grew again by 10% in Brussels in 2010 and we expect similar growth this year, but no volcanic eruption.

AOT: The conference has now more than 2000 attendees. If you look to the future of this conference, could you imagine ways to increase the size, but first, do you think it's reasonable to increase the conference further?

Thienpont: I believe that regarding scientists, we might still grow the number of attendees by let's say 5% to 10% every other year. So by 2014 I believe we can still grow, if you look only to the number of fundamental and applied researchers attending the conference.

AOT: But?

Thienpont: The real difference will be when we're going to involve industry more effectively in the conferences. And we try to do that gradually. I believe that with the new Horizon 2020 framework program of the European Commission, which has been announced this morning here by Thierry van der Pyl [now Director of Components and Systems of the European Commission and former Head of its Photonics Unit], we will have the opportunity to bring more industry people to Photonics Europe and give industry a more prominent place in the conference program.

And I'm not only talking about exhibitors here. I'm talking about collaboration between academia and industry. In the new framework program you will see that most of the funding will be devoted to industrial photonics initiatives, which means that industry will have to take the lead and we'll have an opportunity from the university point of view to validate our research.

AOT: That brings me to the next point. Just a few days ago the Photonics21 meeting concluded. I think Photonics21 has become the biggest photonics research and industry organization in Europe. What do you think about the status of this organization? Is it strong enough to change the landscape, to really have an influence on the European Commission?



Figure 1 Within less than a decade, SPIE Photonics Europe has become the most successful photonics conference in Europe.

Thienpont: I personally believe that by now most – if not all – the important key role players are in Photonics21. That does not mean that Photonics21 cannot continue to grow. They will, I'm pretty sure of that.

Will they have an influence on the European Commission? I think the answer is they already have had a huge impact on the European Commission, but more importantly on the European photonics eco-system. Photonics21 revealed that photonics has an impact on 10% of the European economy; that around 5000 companies are directly involved in photonics components and products in Europe and that photonics economy grows by 8–10% per year worldwide and provides jobs to 300 000 people in Europe. That was a valuable message to the European Commission with great impact. These are times when the world needs positive messages and where politicians have to convey positive and constructive news. Commissioners like Viviane Reding and Neeli Kroes got such messages and success stories from Photonics21, turning photonics into a key-enabling technology for Europe. So I do believe Photonics21 will continue to make a very positive impact.

The question is: What will Photonics21 look like in 1 or 2 years because it will most probably change, in its statute, in the way it is organized. It will most probably reorganize such that it can support a public/private partnership between the European Commission, industry and academia. This will be a longer discussion, but we do know that the impact of Photonics21 will grow.

AOT: Commissioner Neeli Kroes highlighted the public/private partnership. What is the real benefit for the photonic landscape from this public/private partnership?

Thienpont: The answer I think is financial leverage.

AOT: Isn't it another way of pumping money from industry to academia?

Thienpont: No, no. It's not going to pump new funding into academia. What is going to happen is that industry will have to show how strong they are involved in photonics, and how they will invest in photonics and in leveraging their photonics R&D and production capabilities.

And we at the universities will also have to show our engagement in collaboration with the photonics industry. How many of our researchers will be working to validate our research results with European companies? How can our top infrastructure be used in collaborative efforts with European companies? How much access can we give to companies to these facilities? Etc....

AOT: What exactly is the role of the European Commission in this relation?

Thienpont: The European Commission is going to financially match our efforts. In other words, if you are spending money at the university to leverage photonics R&D in collaboration with industry then the commission could financially support these efforts. It is a new approach to leverage investments.

AOT: Many people, particularly from SMEs (small- or medium-sized enterprises, Figure 2) claim that the bureaucracy for European Commission funding is too large. Do you think that with such a new mechanism this problem will at least become smaller?

Thienpont: Honestly speaking, I do not think that the issue of the SMEs will be solved just because of this public/private partnership. On the contrary. Neither will it harm them. It's just a different way of operating. There are however other ways to support SMEs. European support instruments that are less bureaucratic than the present day instruments. An example of that is a support project that we launched about 2 years ago based on a brand new concept. It is called ActMost.



Figure 2 Professor Thienpont illustrates how ActMost supports SMEs based on the successful project with Peira NV.

AOT: What is ActMost and what is different from other European Commission-funded projects?

Thienpont: ActMost is an Access Center to Micro Optics and Microphotonics Services and Technologies. Why have we brought this project to life? Because we believe that from the academic point of view we can really help SMEs. In our particular case we teamed up with 14 top-level institutes that all have their very special and unique technologies. Technologies that SMEs cannot afford. But technologies that are very close to mass manufacturing. Supported by the European Commission, we offer those technologies to SMEs in an efficient way without much administration.

AOT: How do you do that?

Thienpont: What we do is we launch an open call to those companies that wish that we would help them out with their technological challenges in 2 to 3, maximum 6 months time. Administration is minimum, and the cost of the support is fully covered by the European Commission.

Let me explain the idea. Imagine a small company and they have an optical design challenge they cannot handle themselves. They simply need to call our information desk and explain their challenge. Then we identify the best of our experts, send them over to the company, and they start in-depth discussions. Very soon our expert team will suggest a solution.

That task force will now help the SME until the challenge has been successfully tackled. The timing here is essential. The timing between the first contact of the SME and our help desk and the delivery of a practical solution should not be much more than a few months while administration is kept small. This allows fast innovation and quick time-to-market. Two factors that are essential for SMEs.

AOT: What are your first experiences with real-world projects?

Thienpont: So far we have been helping 11 companies, all small- or medium-sized enterprises. The average cost of the projects are around 30 000 to 40 000 €. So, it's not a great deal, while all challenges were solved. Soon after ActMost's intervention most of the companies were able to start production, and it has an immediate impact on the market and on the number of jobs.

Here at Photonics Europe, at the ActMost booth for example, we have a company called Peira. One of their products is a handheld medical scanner for tumors. Their engineers did not have the skills to design the light engine that scans the tumors. First they tried expensive and complicated approaches. After our intervention a much simpler and lower cost solution was developed. Today their product is on the market. It gets high visibility and they're making business.

So, here you see a way to quickly help SMEs, without administration. We do most of the work. We provide experts. We discuss the issues with the companies and co-develop practical solutions with the best technologies available. And ActMost covers our expenses. We don't engage in projects with SMEs that will take 3, 4 or 5 years. That would be way too long. SMEs have to act immediately and they need immediate solutions without big investments.

It's either disruptive solutions or its incremental solutions. We don't care as long as we give them photonics-based solutions. If photonics can't do the job, we will tell them as well. An access center like ActMost is absolutely a new way of acting very fast with a European dimension. We do hope that the European Commission continues to support this initiative (Figure 3).

AOT: It sounds impressive because you avoid the formal application issue where the people collect papers as a 'full brick'. And you bypass the reviewing issue that again takes time. How can you still ensure that your approach delivers appropriate results?

Thienpont: We have a technology coordination team. They select the experts that will visit the companies. They also review the short project proposals that are written by these

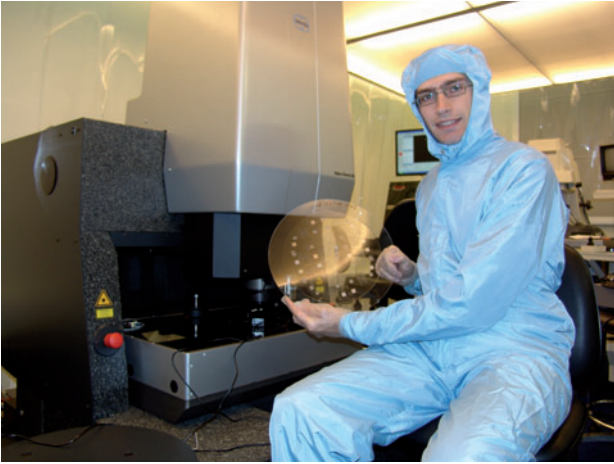


Figure 3 Wafer-scale polymer micro-optics capabilities offered by the new initiative ActMost.

experts and check whether the finances needed to complete the project are realistic.

AOT: Isn't that competition to existing consultancies or, what we have in Germany, the Fraunhofer Institutes?

Thienpont: Yes, it may be seen as a competition to the Fraunhofer Institutes. But, let's be realistic. We are helping European companies by combining the skills and expertise present at different European research institutes. So we're not competing at the regional level. There must be a European dimension to the issue. So, if a Fraunhofer Institute can help a German company that is 30 or 40 km away, then it is great. Let them do it. But what we're trying is different: companies from all over Europe that have a challenge will be connected to experts in other European institutes. We say, if you can't solve the problem regionally, we try to solve it at the European level. That's it.

AOT: European research in academia and industry were major drivers of progress in photonics within the last 200 years. Today, a lot of optics production has moved to Asia and is continuing to move to Asia. So what can European photonic experts or politicians do to save at least our research advance?

Thienpont: Well, I think that until a couple of years ago no university in Europe was interested in intellectual property (IP). The valorization of research results with companies was also not seen as an academic priority. Sometimes contacts and contracts with industry were seen as something dirty or something that could destroy the local research activities. In those days I, too, was involved in fundamental and applied research. But I wanted to go one step further. I tried to work with companies and to transfer my research results to companies. Not to become rich, but just to make sure that somebody would do something with it. And then I understood that this was not the right approach to validate your research, expertise and skills with industry.

What really works is that first you have to listen to the needs of the companies.

I think the time has come that politicians, researchers at university levels, and Chief Technology Officers (CTOs) in companies, all have to listen to one another, team up and try to see what mutual or common benefits we can have. What win-win situations can we create? Let the academicians do what they are good at. Let industry do what they are excelling in. And let us create that interface and make sure that these are not worlds apart. Instead, let's make those worlds converge. Especially in Europe we need this interface, because we may be very good in fundamental research, but we're not so good in transferring our results to companies and turning it into new markets, jobs and wealth.

AOT: Where do you see the challenges to make it happen?

Thienpont: Have you ever wondered how, at an academic level, you are rewarded to transfer your research? We only receive recognition when we publish papers and when we deliver postdocs. There's no remuneration, no reward for transferring your knowledge to companies. Little by little, that is changing. But it takes time. In my opinion too much time. So we need a mentality change towards the acknowledgement of tech transfer. And if politicians need to invest in something, it should be in facilitating research validation.

AOT: Yes. And just to avoid misunderstandings, I think you really mean to make bridges to connect the different parties and not to replace basic research by applied research?

Thienpont: Indeed. It's really about building bridges between the basic research and the industrial arena. Let's not stop the fundamental research. We absolutely need relevant research. But at the same time we also ask respect from those people involved in fundamental research for what we are trying to do in practically validating applied research with companies. Bringing a research result from the lab to the manufacturing floor is as big a challenge than creating a breakthrough in fundamental sciences.

Scientists cannot afford to live in their ivory tower any longer. They cannot look down on everything that has to do with practical applications. At the same time they should be careful with creating high hopes with every new finding and be very careful not to oversell it.

AOT: One example might be: what has become of the frequency combs, which is certainly a basic research result.

Thienpont: Absolutely.

AOT: And is applied today in a number of technical devices...

Thienpont: ...very basic research and 2 years later lots of applications.

AOT: If you ever met Ted Hänsch, he is certainly an absolute basic researcher.

Thienpont: Indeed. But, I also saw this morning a scientific paper explaining the first results of the use of frequency combs to look for extrasolar planets. Here a basic research result is transferred to an application nobody thought about

before. That's what is needed. Bridging gaps, networking and finding and exploiting applications.

AOT: And I think there is the challenge of not only finding out things, but bringing those things over the bridge, of converting ideas into products. In Ted Hänsch's group, they have started at least one company, Menlo Systems. I think there, the beauty of moving an idea from the lab to a product is well recognized. This is the story that has not been told enough yet.

Thienpont: I agree. That is a story that should be told more often especially to our young researchers. Because if they stop when they published their paper, and then they go back to the fundamentals, they're losing a great opportunity and a great experience.

AOT: Yes.

Thienpont: Because it is not finished when the paper is published. No. Everything starts there.

AOT: Yes. And that's a discussion that goes into values. First, it is an honor to get a paper. But secondly, the scientists could get more honors if his idea is turned into a product. If someone could say, I have invented CD-ROM or blue-ray disc, that is already now rewarding.

Thienpont: Absolutely. In my opinion, that is the ultimate recognition. It doesn't stop with submitting the paper or seeing your paper accepted. It only starts at that level and there is more recognition to be won than just an impact factor.



Hugo Thienpont received a PhD degree in Applied Sciences in 1990 at the Vrije Universiteit Brussel (VUB), Brussels, Belgium. He coordinates research and networking projects and manages micro-photonics related industrial projects on a European level. He authored 210 SCI-stated journal papers and more than 440 publications in interna-

tional conference proceedings. Professor Thienpont received the International Commission for Optics Prize ICO'99 and the Ernst Abbe medal from Carl Zeiss. In 2003, he was awarded the title of 'IEEE Photonics Distinguished Lecturer'. In 2005 he received the SPIE President's Award for dedicated services to the European Photonics Community, and in 2007 the International MOC Award for his contributions in the field of micro-optics. Hugo Thienpont is a member of the Board of Stakeholders of the Technology Platform Photonics21.