



Steinbeis-Europa-Zentrum,
Steinbeis 2i GmbH,
Opticsvalley (Ed.)

Towards Best Practice in Photonics Outreach for Entrepreneurs



PHOTONICS PUBLIC PRIVATE PARTNERSHIP



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Steinbeis-Europa-Zentrum, Steinbeis 2i GmbH, Opticsvalley (Ed.)
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Towards Best Practice in Photonics Outreach for Entrepreneurs

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Foreword

Optics and *photonics* are widely regarded today as key technologies. Many science and technology experts have described the 21st century as the century of the photon because optics and photonics technologies are providing science and industry with a wide-range of essential applications impacting nearly all areas of our lives! In fact, Photonics has been recognized as a *Key Enabling Technology* (KET) by the European Commission in a Communication¹ dating back to 2009. However, despite its importance photonics is still not a well-known technology to a majority of people.

This handbook is mainly aimed at those supporting Photonics SMEs; staff of Photonics clusters, Chambers of Commerce, private consultants or other regional/ local development agencies.

The objective of this handbook is to *summarize best practice on how to promote photonics and light-based technologies to entrepreneurs*. We hope that our experiences in the Photonics4All project will serve all those interested as a useful inspiration and guide when promoting photonics. The handbook is not meant to be authoritative, nor exhaustive in terms of photonics outreach, which is why we decided to publish this document with the title '*Towards Best Practice in Photonics Outreach*', but we hope it provides an overview of the best working approaches undertaken in the Photonics4All project and benefits the network of science communicators throughout Europe. The handbook should be relevant to all those interested in outreach, whether a newcomer or the more experienced science communicators, please pick and choose the elements that are relevant for your own outreach activity. To help you, the text in this handbook is accompanied by practical and user-friendly information in the annex; pages of which can be printed out individually. Policy makers too can also find relevant information in the conclusions at the end of the booklet.

1 <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52009DC0512&from=EN>

Please note that two other handbooks are available in this series; one on photonics outreach activities targeted at young people and students in Photonics, and a second one on best practices to increase the general public's awareness of Photonics.

A number of partners have contributed to this publication throughout the project; from the initial proposal of good practices, to the selection of topics and to the final product. We would like therefore to thank the European Commission and Photonics21 for the promotion of the project "Photonics4All" under the EU program "Horizon 2020" for research and innovation, along with our partners who have supported our work during the lifetime of the project. We would like particularly to thank our sister projects "GoPhoton!" and "Light2015" for sharing their best practice in how to increase awareness of photonics, one of which ("LIGHT-talks") is included in this handbook.

*Photonics4All Consortium,
December 2016*

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1 Introduction

A number of different tools and activities were developed by Photonics4All members and their partners (please see Annex 6 for further information about Photonics4All partners) to help support entrepreneurs and businesses in working with Photonics. These tools and activities included: Photonics Bootcamps, Photonics Innovation workshops, a Photonics Start-Up Challenge, Photonics for Investment Events and other events for entrepreneurs which included talks and a brochure for 'How to Start a Business in Photonics. We outline below the objectives for each tool and activity, its target group, how the event was organised, a summary of the event content, the estimated impact and costs, and finally the experience we gained in delivering the activity.

2 Photonics Boot Camps



Objective: Photonics Boot Camps will provide participants with an educational experience to build self-confidence and self-belief in order to *apply entrepreneurial skills to create new ventures* – or to support existing businesses to become more proactive and innovative. A Boot Camp should help participants to understand their own

perceived levels of risk tolerance through; working in teams, interacting with entrepreneurs, simulating business tasks and working on real ideas in creative and practical ways. This highly interactive program may enable participants gain the motivation and focus to build a successful business and create opportunities for themselves.

Target group: PhD students, young entrepreneurs, students

Organisation: Planning the Boot Camp should begin approximately six months before the event in order to organize the agenda and content of the activity, for example arranging speakers, confirming budget and venue and marketing the event through relevant networks. A sample plan can be found in Annex 1. Sample advertising and information on this event can be found here². Participants such as Post Graduate students studying photonics were chosen through an application/selection. For the application, students had to send their CV and a letter outlining their interest in Photonics and the Boot Camp to the organizers.

Content: Example of Topics covered during the Photonics4all Boot Camps:

- Entrepreneurship & Innovation Principles: Participants learn
 - What does it mean to start a company?
 - Typical patterns of entrepreneurial processes.
 - What is a business opportunity?
 - How to systematically identify and evaluate opportunities
 - How to develop and enrich a business opportunity via a structured process
 - How to improve the ability to understand who your customers are, what they want, and what they will pay for
 - How to position a product/ service in the market in a more targeted way
- Business Model Design: Participants learn
 - What are the components of a successful business model?

2 <http://www.photonics-austria.at/projects/photonics4all/photonics-boot-camp-2016/>

- What different kinds of business models exist?
- How to iteratively develop and enrich a business model.
- How to evaluate a company's potential prospects, strengths, weaknesses and risk factors.

All workshop days were designed to be very interactive. Participants had the opportunity to work on their own ideas / technologies throughout the event.

Impact measurement: Photonics4All recommend that organisers evaluate their events both quantitatively and qualitatively to determine the impact of the event. We suggest taking good quality photographs during the event (with participant's permission) and gathering *testimonials not only to help promote future events, but to try to stay in touch* with the participants for long-term follow-up. By keeping in contact with participants we learned that a new start-up was founded. Christos Klamouris, participant of the first photonics boot camp in 2015, recently founded his own start-up with the optowind-technology:

“The experience was fruitful, although I personally had already some marketing background. I also learned from my participation that I need to do my homework with my business model, in order to make it more attractive to potential investors. Thank you very much for your support during the event.”

Christos Klamouris, Germany.

The general evaluation of the first boot camp was very positive, as can be taken from the following testimonials from further participants:

“Thanks for organising a fantastic couple of days. It was really useful for me to learn some new techniques that I was completely unaware of prior to the bootcamp and I will definitely be utilizing them once I begin working on the commercialisation project in March. I particularly enjoyed the guest speaker' talk who gave great talks on first hand experiences in setting up new businesses in the area of photonics.”

James Waterfield, UK

“The course was easy to follow for everyone, even people with no experience in business. The experience of other participants and speakers was also very significant to realise the problems they actually found. Because we were a small group, it was simple to talk and interact with everybody thanks to the role playing-games and team-working time (and of course, social events :D). Thank you for putting in so much effort and make us participants of this outstanding experience! :)”

Gloria Mico Cabanes, Spain

Costs: Photonics4All used about 5,000 € for each Boot Camp. This amount covered not only the organizer’s costs for the Boot Camp, but also costs for the participants – who attended for free. In addition, some funding for the participant’s accommodation was made available to them.

Gained Experience: Photonics4All ran two Photonics Boot Camps in Austria during the two year project. The first Boot Camp was fully booked and the majority of interested participants were reached. In the second year the number of applicants was much lower and the Boot Camp was held in collaboration with the existing Alpbach Summer School on entrepreneurship. When planning this sort of activity we recommend teaming up with other organisations targeting entrepreneurs generally, and organise an element of Photonics outreach within the larger event.

Knowledge angel / point of contact: Ulrich Trog, Photonics Austria



Figure 1: Discussions at the first Boot Camp in Vienna, Austria in September 2015. Source: Photonics Cluster Austria

3 Photonics Innovation Workshops



Objective: Photonics is a cross-sectoral technology as well as being an industry of its own. Innovation increasingly occurs at the intersection of various technologies. In Europe, SMEs, microenterprises and start-ups in particular require special support in order to keep up with ever-shorter innovation cycles and successfully bridge the “valley of death” from good research to the introduction of new products and services on the market. In the case of photonics, both the users and potential users of light-based technology from R&D and industry are often unknown, and thus an unknown potential which has to be identified to develop appropriate solutions. Therefore, it is essential to optimize innovation methodology, to establish an open culture of innovation and to strengthen inter-sub-disciplinary and cross-sectoral technology transfer.

The main objective of the six Innovation Workshops held in Germany was the *generation of innovative ideas, new collaborations and the identification of new potential applications for photonics technologies* within the confidential and supportive environment of a cluster.

The Innovation Workshops had another, very specific objective: to assist with the design, testing and publishing of guidelines on how to use the ‘Open Innovation’ method, which was adopted with the workshop participants. The method includ-

ed idea generation and exploitation for companies (especially start-ups and SMEs) and the general public. The first three workshops helped to produce the publication “*Guidelines – Open Innovation in Photonics*”³ and the last three workshops helped to test and implement the approach outlined by the guide. Finally, the workshops provided the basis for potential partnership agreements.

Target group: academia and companies

Organisation: The workshops were hosted by companies or research organizations, operating in the relevant application sector in collaboration with a photonics cluster. The workshops were attended by average 25 experts from research institutes, companies (especially SMEs) and business incubators from significant photonics application sectors (e. g. sciences, production, energy and ICT). Please see Annex 2 for an example of agenda.



Figure 2: Presentation „Methods and Tools for Cooperate Engineering“ of Dirk Ortloff, camLine GmbH (left), Audience during the workshop (right).
Source: OptecNet Deutschland

In the workshops, we included and summarized cluster member’s interests and knowledge about topics at the cutting edge of photonics subsectors. We acquired knowledgeable speakers able to discuss innovation in these subsectors to transfer knowledge and to illustrate different ways to generate innovation in photonics. An essential outcome of the workshops was the *importance of focusing on the unknown users*, as well as discussing the importance of the customers, end users and suppliers. Speakers were asked to keep a focus on these issues in their specialist lectures. Every presentation of technical and methodical innovation was followed by a dis-

3 http://photonics4all.eu/wp-content/uploads/2015/03/Guidelines-Open-Innovation-in-Photonics_P4All1.pdf

discussion between speakers and participants. The workshop content was planned with a balance of specialist lectures and best practice from companies and lectures / discussions regarding ‘Open Innovation’ method and networking activities. Attendees also discussed the demand in open innovation methodology, tools and best practices to adapt further workshops and activities of clusters to their needs.



Figure 3: Meet & Match Speed-Dating rounds with a short self-introduction and the idea generation of a common project (left), company visits (right).
Source: OptecNet Deutschland

Both coffee breaks and company visits provided good opportunities for networking, which was a very important reason for attending the Innovation Workshops.

Participating companies and research institutes provided useful insights and starting points for co-operation with participants after the workshops. As personal contacts and direct transfer of knowledge serves as a basis for initiating collaboration and joint projects, the last three Innovation Workshops were organized within the content of working groups of the regional photonics networks. In order to aid networking in a concentrated way OptecNet Deutschland implemented a – for working groups – new tool, ‘Speed-Dating’ in two of the three last Innovation Workshops.

Impact measurement: The impact of the workshops can be assessed by looking at the number of workshop attendees per photonics subsector and compare it to the total size of that subsector. We learned that evaluating the success of the workshops by the number of partnership agreements signed as a result of the workshops (using a short template provided by the Photonics4All partners) was not appropriate because creating partnerships is a long-term process and only a few companies /

organizations were willing to sign agreements in such early stages of the process. During the last three Innovation Workshops, five Partnerships Agreements were signed. The personal feedback of the attendees during and after the workshops, as well as long-term feedback in form of close personal contacts by the cluster management, are the most significant measurement of impact. Gained experience and attendance of follow-up workshops will increase the impact of the original Innovation Workshops and will help the attendees succeed.

The real impact of the Innovation Workshops cannot be measured immediately after the events and can often be unseen by the organizers. Many collaborations begin several months after meetings and workshops; common ideas have to grow and one needs a large network to find the right partners. So Innovation Workshops are a perfect place for open innovation, innovation culture living, idea creation and getting in contact with people of other companies, research institutes from the same or other sub disciplines or other sectors, but their real long-term impact is quite difficult to measure and requires long-term evaluation methods.

The innovation does not usually occur in a single workshop; it is more about a combination of providing an innovation culture, with knowledge transfer and networking opportunities and having many potential starting points and many other supportive processes. The Innovation Workshops unify many of these aspects thus playing an important role for generating innovation in a highly specific sector like photonics.

Costs: 1,000 € per Innovation Workshop

Gained Experience and Recommendations: As a result of evaluating business opinion before and during the workshops we found that there is a great need for networking events which include technology transfer, talks on photonics methods and applications, best practices and group work because of the specificities of photonics itself. Moreover, a networking culture is an indispensable part of an innovation culture. In Photonics, knowledge transfer and networking can thrive in the confidential and supportive environment of a cluster. *Networking is very important for photonics as a cross-sectional technology*, where innovation occurs at the

intersection of different sectors, and users are often unknown and the approach of an Innovation Workshop works very well to address these issues.

The Innovation Workshops should be kept regional oriented to limit travel time and travel costs, which are taxing on the resources of companies, especially SMEs. The length of Innovation Workshops should be one-half to one day; otherwise it may be difficult to recruit participants. We recognise that to keep the Innovation Workshops regionally oriented is a bit of a contradiction to the open innovation approach generally, however, in order to open innovation to flourish, trust is important and trust is more like to exist, or develop, in a relatively small environment with familiar contacts. To overcome this contradiction, cross clustering and sharing of tools and experiences with other clusters and counties is important, as is encouraging external experts to attend as speakers.

Within workshops, there should always be an emphasis on aspects of technical innovation in lectures as well as on integrated application sectors and end users.

We recommend “Speed-Dating” or “Speed Networking” opportunities in workshops and working group meetings as they encouraged many aspects of open innovation. They are a good method to generate new contacts and potential collaborations in a very efficient way.

The workshop consensus: Because photonics is a cross-sectional technology, where the users are often unknown, workshops are the best tool for personal networking and more detailed discussions about photonic. Workshops aid idea generation and new collaborations and / or projects. The strictly confidential environment of a cluster is hugely important and the only way to provide open innovation for participants from different disciplines. Almost every attendee gained one or more project idea / partners as a result of attending the workshops.

Knowledge angel / point of contact: Johannes Verst, OptecNet Deutschland

4 Photonics Start-up Challenge



**EUROPEAN PHOTONICS
START-UP CHALLENGE**

The stepping stone for your business!

Objective: In the EU, the *support of 'Founders' or new 'Start-ups'* is an important political objective. The need to support new businesses therefore is not so much of a problem of recognition, but more a problem of how best to implement it. One way would be to *encourage a culture of risk by increasing the confidence of entrepreneurs and acknowledging their bravery*. This support is especially important to photonics entrepreneurs working in a relatively new field, which is mostly unknown to the general public.

The European Photonics Start-up Challenge was created to address these issues by providing financial reward, free marketing, and networking opportunities for new companies the details of which are described further below.

Start-up companies who took part in the start-up challenge competed for the financial reward of a cash price designed to help the company customize their web presence or purchase new laboratory equipment.

Businesses taking part in the Challenge benefitted from appearing in press reports about the competition and it was considered to be a helpful marketing activity to promote Photonics technology, services or business models of start-ups throughout Europe generally too.

The Challenge gave Start-Ups the opportunity to take part in an event at a photonics trade fair at which they gave marketing pitches and gained support from networking activities with not only the photonics sector, but also with potential

investors, business angels, customers and co-operation partners in research and development. Furthermore, photonics networks and clusters provided further support, coaching and consultation to the Start-Ups with their services and activities. The Start-up Challenge format provides an opportunity to educate and encourage students, young researchers and employees, as well as members of the general public to start their own company. The Start-up Challenge also widely promotes the importance of science to our European economy and society in general while stimulating entrepreneurship and supporting innovation in photonics.

Target group: Start-ups and Entrepreneurs

Organisation: OptecNet Deutschland obtained sponsorship through networking and marketing the competition. They offered organisations three ways in which to support the Challenge through three different *sponsorship packages*, and produced a flyer with a short description of the packages:

1. A bronze sponsorship of 1,000 €: presentation of company logo on event flyers and promotional websites, as well as being referenced as sponsor in all invitations by email and in all press releases and announcement during the final pitch event.
2. A silver sponsorship of 2,500 €: the sponsor receives a bronze package, and includes a presentation of the company's promotion material and one roll-up display during the event.
3. A premium sponsorship of 5,000 €: the premium sponsor receives the silver package, plus the opportunity of being part of the jury.

Not only was the financial support essential, but also links to the company's services or promotional support along with connections to further sponsors, start-ups and jury members.



Figure 4: Award ceremony of the European Photonics Start-up Challenge.

Source: OptecNet Deutschland

The *event venue* was the “Micro Photonics”⁴ International Congress Expo 2016 in Berlin. A so-called “career lounge” in the third exhibition hall (hall 7.2c) of the micro photonics expo was made available to students, apprentices, university graduates and Young Professionals who wanted to get in touch with companies and institutes from the photonics industry.

As an *award* for the winner, OptecNet Deutschland provided a cash price, a coaching package and a professional article in the journal PHOTONIK⁵ along with a laser-engraved cup. Every finalist was granted a sum up to 300 € for travel expenses per start-up. In addition, the finalists were supported with a three-day trade fair presentation at the event place.

The *promotion* of the European Photonics Start-up Challenge started five months before the final event. A flyer and webpage were designed to promote the Challenge, along with the application form and criteria for the jurors. All Photonics4All partners promoted the European Photonics Start-up Challenge throughout their networks. Photonics incubators, research institutes, universities and companies were also asked to promote the Challenge to their employees and known Start-Ups. After the application deadline, the flyer was updated with names of the eight

4 <http://www.micro-photonics.de/en/>

5 <http://www.photonik.de/>

finalists. This promotional material was disseminated through the photonics partner's industry networks again to reach a large audience for the marketing pitches. Information about the finalists was also included in the micro photonics trade fair and congress programme.

The finalists presented their business model in *short marketing pitches* to the jury and the audience. Finalists were allowed three minutes and three slides to deliver their presentations. After the 3 minutes, a time-out slide ended the presentation and the microphone was turned off. Then, the jury could ask question the presenters for up to five minutes to clarify issues they did not understand or that they missed in the presentation.

The *jury* consisted of five photonics and business expert. They evaluated the presenter's business models using the following specific criteria: technical performance, business idea, innovation potential, competitive advantage and pitch performance. These criteria are the main basic prerequisites to convince investors to invest, and to ensure the company can survive in the business world. The jury used a scoring system to assess each criteria from one to three (one – ok, two – good, three – very good) for each start-up presentation. The winner was thus the start-up with the highest sum of notes.

The *award ceremony/final* of the European Photonics Start-up Challenge was open to all congress and exhibition visitors. People who were interested in attending the Award Ceremony of the European Photonics Start-up Challenge could register on the website of OpTecBB to receive a one-day free visitor code for the fair micro photonics.

After the award ceremony, the start-ups, the jury, the lectures and the audience were invited to discuss the presented topics and network. Light catering was provided as part of the event. The European Photonics Start-up Challenge addressed all kind of start-ups: service providers and equipment developers, as well as young founders with a photonics-based business idea and European-wide well-established start-ups. The start-up with the most innovative, the most competitive, the most well-developed business model with the best skills / pitch performance won the European Photonics Start-up Challenge.

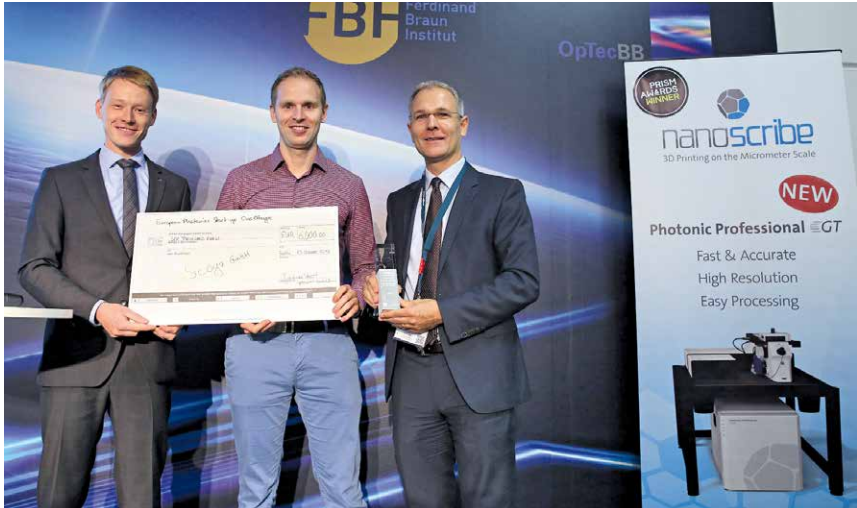


Figure 5: Award ceremony: The winner of the European Photonics Start-up Challenge Sicoya GmbH (middle) and the organizers Johannes Verst from Photonics BW (left) and Dr Frank Lerch from OpTecBB (right) with a roll-up of the premium sponsor Nanoscribe GmbH⁶. Source: OptecNet Deutschland

Impact measurement: The European Photonics Start-up Challenge was a great opportunity to support start-ups in terms of finance, marketing, consulting, networking etc. as well as promoting entrepreneurship. The event was successful in encouraging the photonics community to consider founding a start-up in photonics, encouraging a risk culture and raising the profile of entrepreneurship. Almost every finalist thanked Photonics4All for the great opportunity of giving them a public stage for their business.

OptecNet Deutschland was also able to provide a few introductions between finalists and business contacts to companies and research projects. Other Start-up challenge organisers from Germany, France and USA benefitted from learning about the organisation, promotion process and the results.

The European Photonics Start-up Challenge had a great media coverage, with many reports Photonics news media. The finalists were very happy about the or-

⁶ <http://www.nanoscribe.de/en/>

ganisation of the challenge, the corresponding support and its results and OptecNet Deutschland gathered four partnership agreements (start-up – start-up, start-up – jury member, start-up – sponsor) from the start-ups as a result.

Costs: 5,000 € (without sponsorships)

Gained Experience and Recommendations: In order for the European Photonics Start-up Challenge to succeed, a large marketing coverage, the support and promotion of many partners (Photonics4All consortium, micro photonics, the journal Photonik, juror’s companies etc.) was needed. In order to ensure a large audience the event should definitely be organized within the context of a larger photonics event and be held within the event venue in order to ensure a large audience.

Consequently naming the start-up challenge the “European Photonics Start-up Challenge” made the event interesting to both the press and the photonics community. Because there are so many pitch events, thinking of a unique name for the event was very helpful to encourage broad reporting and thus a bigger impact through marketing.

Sponsor acquisition is a difficult task, because of so many sponsoring activities of the companies. Sponsorship agreements need to be gathered very early on in the organisational process and are best achieved through personal contacts, during face-to-face meetings or phone discussions rather than by any other means.

Few start-ups considered the marketing impact generated by the challenge more important than a cash prize, but it depended on the level of maturity of the start-up (newer start-ups valued the cash prize more than the marketing).

Knowledge angel / point of contact: Johannes Verst, OptecNet Deutschland

5 Photonics for Investment Events

Photonics Venture summit

Objective: The Photonics Venture summit pursued three main objectives:

- To *connect entrepreneurs looking for funds with private investors* seeking to invest their money,
- To *inform and educate private investors*, not only on commercial and financial opportunities related to photonic technologies, but also about their specificities (degree of disruptiveness, R&D maturation, generic technologies, capital intensive and low scalability).
- To *enable entrepreneurs to gain experience on the art of the pitch*, which is becoming an increasingly important skill.

Target group: Entrepreneurs in photonics

Organisation: Two venture summits were organised during the project: one in Paris in June 2016 and one in Bordeaux in October 2016: “INPHO Venture Summit”⁷.

During the first event, 13 start-ups pitched in front of 29 investors from different categories: venture capital, business angels, corporate investment and crowd-funding. In parallel, 2 experts in finance gave feedback to members of the photonics community attending. During the *networking session* that followed the *itches*, start-ups were also able to present their products & services.

The event in Bordeaux is held every two years and gathers together large companies, venture capitalists and start-ups to meet to develop collaborations, while exchanging on key bankable challenges to invest in. This year, the program focused on four main applicative sectors for photonics: Energy Efficiency, Health / consumers, Telecom / datacoms and Mobility / autonomous vehicles.

⁷ <http://www.inpho-ventures.com/>

For each of these topics a round-table was organized to discuss market trends and needs, and photonics companies were given the opportunity to pitch in front of investors.

In parallel to the *round tables*, the SMEs could also meet the investors during one-to-one meetings set-up for them in an open innovation framework by a dedicated consultant. These 1 / 1 meetings were for most of them planned in advance, but a lot also happened “in situ”, during the networking sessions & breaks.

Impact measurement: The impact measurement must cover three aspects; first is the number of investors who were present, the second element of evaluation is the number of matchings between entrepreneurs and investors and the third, more qualitative, is the degree of depth of the discussion. Indeed, it is interesting to know if the matching was limited to a formal match-making or whether it has evolved in:

1. a study of the project, including the business plan;
2. an appointment for a thorough discussion;
3. a raising of funds.

The investigation must take place after a few months because the board of venture capitalists usually met twice a year.

Impact evaluation: For the first event, the results of the post event survey were very positive:

- almost all start-ups managed to have direct contacts with investors during the event
- half of them managed to have their business examined by the investors
- and finally around 80% had planned a private meeting with investors after the project

During the second event in Bordeaux, one pitching start-up was awarded 5,000 €.

Costs: the organizational cost of a venture summit is 4,000–8,000 € (for 60 participants). This covers the costs of location, catering and speakers (fees and travel), but also coaching for entrepreneurs. This type of event can be sponsored.

Gained experience & recommendations: Beyond the traditional aspects of agenda and content (speakers, budget, location), it is highly advisable to be vigilant to the match between start-ups and investors in view of the wide variety of private investing (crowdfunding, bank, business angels, venture capital, corporate capital and family office), to ensure the relevance of the event (i. e. the effectiveness of match-making). It is important to ensure a good fit between start-ups and investors considering the following points in particular:

1. the amount of desired funds raised;
2. the maturity of the start-up (pre-creation, creation, post creation VS capital development);
3. the industry the start-up belongs to.

In terms of content, beyond the start-up pitch (3–7 minutes), it is useful that investors express their needs and their investment strategies to educate entrepreneurs and to make them – eventually – change their business plan. It is also interesting to fund coaching for entrepreneurs and impose start-ups to have an updated business plan to attract investors.

As a further recommendation, we believe it is important to locate the venture summit in an area that preserves the anonymity of discussions. In particular, we need suitable areas for open networking, as well as for one-to-one meetings. Moreover since start-ups have only one chance to make a good first impression, it is advisable to coach entrepreneurs on the specific expectations of investors (they must get to the point: what is the problem I address? What is my technological solution? How is it different from competitive solutions? What is my business model?).

Conclusions: This type of event is beneficial for entrepreneurs because, apart from enabling them to raise funds, a venture summit allows entrepreneurs to better understand the expectations and strategies (including exit strategies) of investors

who are part of a very varied population. This type of event is also useful to the European photonics industry in that it informs and enthuses investors about the beneficial characteristics of photonics companies. Investors are witness to “entrepreneurial effervescence and the business opportunities of photonics start-ups, which may result in specific funds more suitable for photonics companies to be made available. Finally this type of event is necessary to photonics clusters because it improves the quality of their support in funds raising actions, in particular by optimizing match-making based on many criteria; such as project maturity, the nature of projects and the type of business model (B2B, B2C, etc.).

To strengthen and ensure future investments in the photonics industry, policy makers should:

1. Contribute to the creation of an investment fund which should be more adapted to the fundamentals of photonics start-ups, including taking (public) stakes in the funds, as does the BPIFrance in France. In this case, we need to extend efforts;
2. Extend (local or national) tax policies and tax strategies to strengthen private investment in technological SMEs and start-ups;
3. Contribute to the implementation of a European venture summit to promote European private financing in promising photonic start-ups, based for example on the INPhO summit in Bordeaux (France)

Knowledge angel / point of contact: Jonathan Bainée, Opticsvalley (France)

6 Other Photonics Activities for Entrepreneurs

LIGHTtalks



Objective: to encourage entrepreneurs to look towards photonics when thinking about creating new companies, products or solutions. Photonics4all, together with GoPhoton!⁸ and LIGHT2015⁹ aimed to convince entrepreneurs in Europe to see photonics as a technological area with large market potential, an area where big things happen and with social impact. The final goal was to increase the interest of industry in photonics, encourage established businesspeople to use photonics technologies and *create open channels of communications with established businesspeople currently outside of the photonics arena.*

Target group: entrepreneurs, students attending business schools, industry.

8 <http://gophoton.eu/>

9 <http://www.europe.light2015.org/>

Organisation: *LightTalk* is an ECOP developed format, analogous to TEDx, created within GoPhoton! that has been exported to other projects such as LIGHT2015 and Photonics4all. It has been adapted to three conceptually different target groups:

- “Lighting the Future” for the general public,
- “The Power of Photonics” primarily for companies and
- “Photonics for Careers” for students and young professionals.

LIGHTtalks consist of an array of live presenters from the scientific, entrepreneurial and industry communities speaking about different aspects of photonics. The specific feature of the LIGHTtalks series is that through the profiles that are made available, talks are delivered using a pre-defined format and with guidelines and advice provided to local organizers to simplify the setting up and implementation of the events.

While the profiles (see Annexes 3 and 4) pre-define the structure and topic of the LIGHTtalks, organizers are responsible for:

- Identifying the venue and the speakers
- Promoting and disseminating the activity
- Implementing the activity

These profiles set the framework of the activity and ensure easy replication, at the same time allowing an adaptation of the activity to make it more appropriate for local needs, allowing the organizer to take into consideration the local research and industry landscape into consideration when identifying the speakers.

Tools: ECOP, within the LIGHT2015 project, developed two videos the video “Careers in Photonics”¹⁰, aimed at providing a glimpse on the professional opportunities that photonics offers the citizens and the video “Lighting the Future”¹¹

10 <https://www.youtube.com/watch?list=PLxdnewf4h751CxEc-o1xKKHLrHe63bgCL&v=RA5VnCFbnjM>

11 <https://www.youtube.com/watch?list=PLxdnewf4h7524QtLnG0mokSwZyqXotP-K&v=C0HPNwN2hPk>

that is available in all EU official languages and focuses on showcasing the broad applications of photonics technologies.

A briefing documentation to replicate LIGHTtalks activities can be found here¹² as well as in Annex 4 and 4.

Impact Measurement: Organizers were asked to provide the number of different stakeholders contacted for the event, and how many of those were engaged.

Satisfaction level of attendants was measured at different levels:

1. General level about the liking of the activity, structure, length, speakers, ...
Some organizers went into further detail by segregating the event into phases and asking for the opinion about each individual speaker, for instance
2. Attendants were asked if the LIGHTtalk had been helpful in better understanding their current or future business
3. The type of information provided during the event was also evaluated in terms of its usefulness

Statistical information was collected, including attendance, female / male ratio, etc.

Costs: three main types of costs are associated to this activity:

1. Speaker costs (fees and travel)
2. Facilities
3. Dissemination materials

being the total budget between 500 and 10,000 € depending on the organizer.

Knowledge angel / point of contact: Lydia Sanmarti, ECOP Secretariat: ICFO – The Institute of Photonic Sciences

12 <http://www.europe.light2015.org/Home/Resources/LIGHTtalks.html>

**Further tool for entrepreneurs:
brochure “Create your Business in Photonics!”**

Objectives: Another tool developed by Photonics4All was the “Create your Business in Photonics” brochure, which aimed to promote photonics to both future and established entrepreneurs. The objective of this brochure was to increase awareness of the various photonics technologies and related markets that exist.

Future entrepreneurs in universities, engineering or business schools, were addressed by the brochure in order to make them want to create companies in the Photonics sector. Regarding established entrepreneurs, the objective was to target company managers, who are not currently aware of the potential benefits of using photonics in their companies, to encourage them to use more photonics technologies in their work processes.

Target group: students & (young) entrepreneurs

Organisation: The brochure contains a description of photonics technologies and related sectors with a regional focus on the needs of these industries for each of the consortium’s partner’s countries involved in the task.

Each brochure is organized as following:

- a few lines of introduction on the Photonics sector in each region
- a description of the mature photonics technologies in each region
- photonics applications relevant for the future: this section provides examples of market needs and high potential optics / photonics technologies in each region (applicative markets – e. g. mobility, telecom, defence & security, health & well-being – with short market description, technologies, trends, challenges and opportunities)
- support for entrepreneurship in Photonics in each region (description & contact details)

In total, 8 brochures have been issued: one brochure per country in each native language plus a European brochure in English gathering the information from the 7 countries involved.

The brochures can be downloaded on the Photonics4All's official website here¹³.

Costs: divided into personnel costs to develop the brochure and printing costs

Knowledge angel / point of contact: Fiona Gerente, Opticsvalley (France)

¹³ http://photonics4all.eu/wp-content/uploads/2015/08/Create_your_business_-_Europe_web.pdf

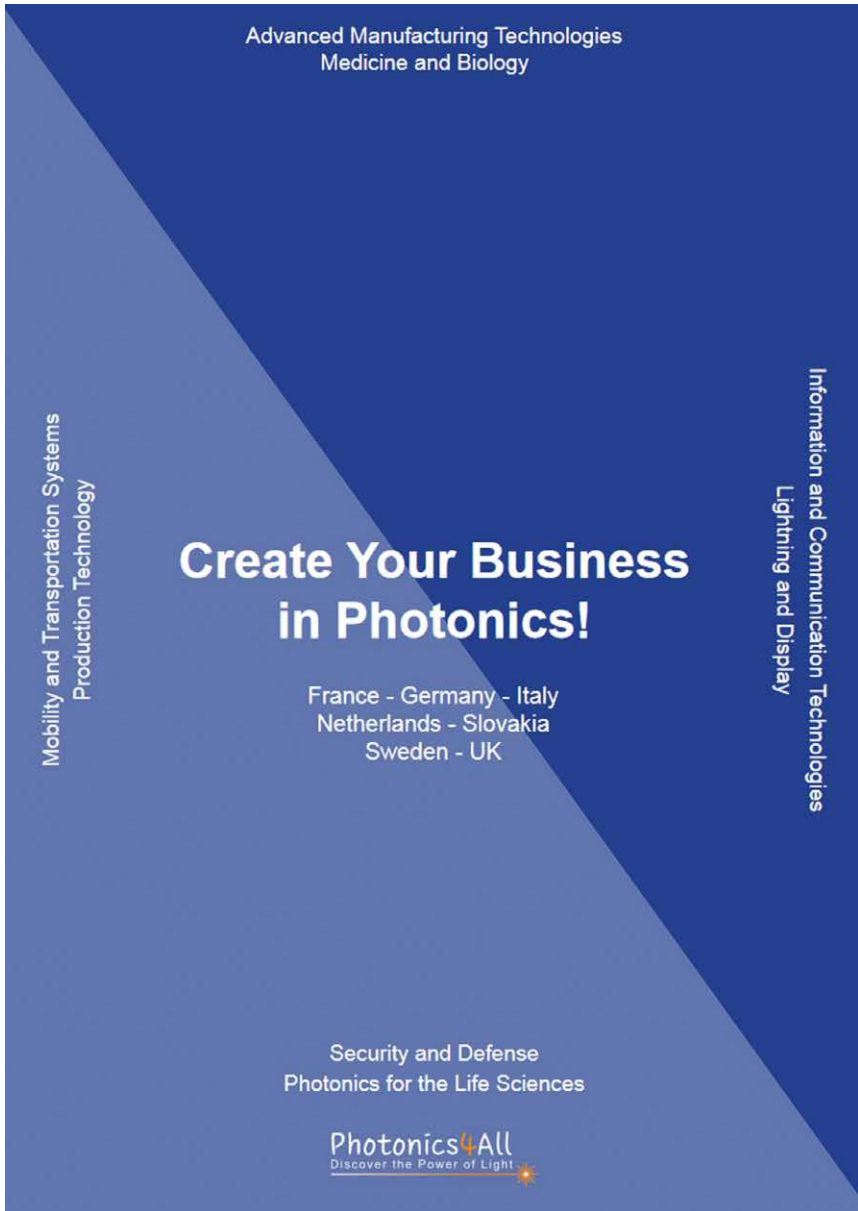


Figure 6: Cover page of the Photonics4All brochure “create your business in photonics!”

5 General conclusion and recommendations

Conclusion

All the activities shown in the table below were conducted successfully during the project in order to create new careers in Photonics, or to help entrepreneurs develop their activities. They were all quite different, with their advantages and disadvantages as the following table illustrates (a more detailed overview table is available in Annex 5):

	Advantages	Disadvantages	Cost €	Results
Boot camps	Strong interest from participants (students & young entrepreneurs)	Difficulty to fill in the sessions for the specific topic of Photonics, so that it is advisable to collaborate with existing events (like summer schools on entrepreneurship a.s.o.)	5,000	18 participants in the first boot camp, 1 start-up creation since the beginning of the project
Innovation workshops	<ul style="list-style-type: none"> ▪ The organiser can collect feedbacks on SME's strategy in long-term ▪ the workshops enable cross-sectoral innovation ▪ networking sessions very successful 	impact difficult to measure (Photonics4All prepared templates to publish Innovation Offers & Requests and to document to be signed in case of partnership agreements but low usability of such tools)	1,000	6 innovation workshops with great success in regular working groups of regional cluster organisations and format / content adoption for further meetings, many potential partnerships (lots of listed ideas requiring follow-up in a few month time)

»»

	Advantages	Disadvantages	Cost €	Results
Start-up Challenge	increasing awareness level (photonics community and investors), public acceptance of risk culture, idea of founding an own company	complex organization	5,000 without sponsorship	<ul style="list-style-type: none"> ▪ 4 partnership agreements shortly after the event, ▪ a huge interest of the photonics community
Investment events (venture summits)	Good ROI (lots of satisfied participants) Increase of investors' interest on Photonics, and increase of understanding of investors' strategies for photonics SMEs.	Quite a heavy organization and high cost.	6,000 for 60 participants	Results of one venture summit with 75 SME participants 6 months ago: 34 contacts between photonics SMEs and investors during the event, 14 business examined & 9 meeting planned between SMEs and investors
LIGHTtalks: Careers in Photonics	Increase of business and investors' interest on Photonics	Need for high-quality lecturers, need for appropriate contacts among business partners	500-5,000 / event	16 companies at 2 events

It is therefore very difficult to advise on which of these activities should someone supporting Photonics entrepreneurs duplicate as each activity can support businesses at different stages in their development:

- The Boot camps are targeted at young people in order to make them want to become entrepreneurs in Photonics.
- The Photonics Innovation workshops are targeted at more established companies, to help them find new ideas to develop their innovation process. We can assume the participants interested in this support are mostly young SMEs.
- The European Photonics Start-up Challenge was also aimed at young SMEs and it was a great opportunity to support start-ups in terms of finance, marketing, consulting, networking etc. as well as promoting entrepreneurship. The event

served to make the wider photonics community more aware of start-up businesses in photonics and the importance of encouraging a culture of a risk.

- The investment events are targeted at already established companies, looking for money to develop their products & services. This type of activity can be relevant either for newly established SMEs or older ones, depending on their development stage.

So in summary all these activities are interesting and relevant for Photonics SMEs and start-ups, they just have to choose according to their stage of development and priorities.

What could Policy Makers do to provide extra support?

One recommendation is to merge Photonics *Boot camps* with other events on general entrepreneurship for young people, while providing specific funding for the photonics element for the training.

Innovation workshops and other activities are able to promote the “open innovation” approach from the development and implementation of an innovation culture to the definition and implementation of innovation tools and processes. For a sustainable establishment in the business environment, especially of SMEs, a consequent and frequent repetition is a key objective to support innovation in photonics. A series of workshops should therefore be funded.

A *European Photonics Start-up Challenge* with a complex organisation and high costs supports founders and start-ups with new business ideas and models, which is generally less a problem of recognition, but more a challenge of implementation. A risk culture should be rewarded and encouragement should be given to raise the profile and confidence of brave and young entrepreneurs. In addition students, young researchers, employees as well the general public should be encouraged to start their own company in Photonics and this should be publicly debated.

Regarding the *investment events*, the main issue is the quite high cost of such an event. Even if sponsorship is a good answer, it is not always easy to obtain. Public support for organizing such events is thus strongly encouraged.

In summary, the recommendations are the following:

- contribute to the creation of an investment fund more adapted to Photonics start-ups,
- extend tax policies to strengthen private investment in technological SMEs and start-ups,
- contribute to the implementation of European venture summits to promote European private financing in promising photonic start-ups.

6 Annexes

Annex 1 Public engagement activity plan

This is an example of a planning table to help conceptualize public engagement activities, here taking the example of Photonics Boot Camps.

Aims & Objectives: (To include Learning Objectives)	INPUTS What is required to achieve the aims & objectives e. g.: how much time / money resources are needed? What needs to be organised e. g. Venue / support.	ACTIVITIES What the project does with the resources; its processes, tools, events, activities and actions (e. g. what are you going to do?)	OUTPUTS Direct products of the project e. g. types, levels and targets of what will be delivered (What will the participant do / produce?)	OUTCOMES Specific Changes in participant behaviour, knowledge, skills, attitudes and level of functioning. What will the participant have learned?	IMPACT The intended or unintended change in organisations, communities or systems as a result of the project
<ul style="list-style-type: none"> ▪ achieve the deliverable ▪ train future entrepreneurs to create a successful business in Photonics ▪ motivate Entrepreneurship (do your business in Photonics) ▪ successfully pitch a business idea 	<ul style="list-style-type: none"> ▪ Future Entrepreneurs (target) ▪ Venue ▪ Partner ▪ Catering 	<ul style="list-style-type: none"> ▪ Run a Boot Camp 	<ul style="list-style-type: none"> ▪ LinkedIn Group ▪ Page on Photonics Austria Home-page 	<ul style="list-style-type: none"> ▪ Changing attitude, ask them... → quotes directly (six months after the event?) → send some valuable tools to the last participants ▪ pitch & idea 	<ul style="list-style-type: none"> ▪ follow-up in 5 years ▪ 5 years later – the participants leave their successful business

The above table is adapted by Photonics4All from a planning tool – or Logic Plan created by Dr H. Featherstone, the University of Bath, UK

Annex 2: Innovation Workshop 1 – Agenda



Agenda 1st Innovation Workshop „Photronics4All“

at the 5th meeting of Arbeitsgemeinschaft / Fachgruppe „Kooperative Innovation“
organised by Photronics BW and MicroTEC Südwest
Tuesday, 24. March 2015
at Automotive Lighting Reutlingen GmbH, Tübinger Str. 123, 72762 Reutlingen

Objective: Discussion of Innovation Demand and Open Innovation Methodology / Tools

9:00 Uhr: Arrival of Participants, welcome coffee

- 09:30 **Welcome and Presentation of Automotive Lighting**
Carlos Schantl, Automotive Lighting
- 09:45 – 10:10 **Innovations in exterior vehicle lighting**
Johannes Geywitz-Senn, Automotive Lighting
- 10:20 – 11:45 **Methods and tools for cooperative engineering**
Dirk Ortloff, camLine GmbH
- 10:55 – 11:20 **Knowledge management in collaborative company networks**
Prof. Günther Würtz, Steinbeis-Transferzentrum MIT
- 11:30 Coffee & Communication
- 11:50 – 12:15 **InnovateBW: Impulses for Innovation & Entrepreneurship – an Open
Innovation platform**
Alexandra Rudl, bwcon GmbH
- 12:25 **Presentation of "Photronics4All" project and BMBF-call „Photonik: Open
innovation“**
Discussion of Demand in Open Innovation Methodology
Eva Kerwien, Photronics BW
- 12:45 **Election of a new spokesperson**
- 13:00 lunch
- 14:00 **Development of a group expertise index**
- 14:40 **News from the networks**
Events, seminars, projects, other
- 14:50 Discussing the next meeting
- 15:00 **Company tour**
Light channel, tool making, production

Approx. 16:00: end of the event

Please register before march 17th with

Photronics BW e.V., Eva Kerwien, kerwien@photonicstw.de, 07364 / 20 78 74
or MicroTEC Südwest, Dr. Klaus Funk, klaus.funk@mstbw.de, 0711 / 22 835 -881



This project has received funding from the European Union's Horizon
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644606.

Annex 3: LIGHTtalks: Lighting the Future profile by GoPhoton!



<p>Description</p>	<p>A series of inspirational talks targeting entrepreneurs focused on the multidisciplinary uses of Photonics</p> <p>The session will be composed of a series of experienced speakers delivering talks that illustrate on the one hand the entrepreneurship model and on the other, the applications of Photonics for industries, with special focus on cross-disciplinary, cross-KET, and cross-sector applications.</p> <p>The session will focus on:</p> <ul style="list-style-type: none"> ▪ Expose the potential of Photonics for novel applications ▪ Emphasize the contribution of Photonics to the economy ▪ Highlight the ubiquity of Photonics ▪ Motivate entrepreneurship ▪ Inspire entrepreneurs to come up with Photonics-enabled innovations
<p>Objectives</p>	<p>To create awareness among entrepreneurs and potential entrepreneurs and industry members, about the economic and industrial potential of Photonics, thereby encouraging them to consider Photonics as an interesting field to start enterprises / to include photonics in existing businesses</p>
<p>Structure</p>	<ul style="list-style-type: none"> ▪ <i>Introduction of the event</i> and the speakers by the moderator ▪ Screening of the <i>industry video</i> developed within LIGHT2015 ▪ <i>Introduction about photonics and the power of light</i> 20 minutes ▪ <i>Inspirational talks</i> in pill format by each speaker (about 5–7 speakers) 5–10 minutes ▪ <i>Short break</i> ▪ Round table and Q&A session 45 minutes

<p>Structure</p>	<p>Moderator: node's representative</p> <p>Key note speaker: <i>VIP profile:</i> to provide the general context of the global photonics market</p> <p>Potential Speakers: <i>Group of speakers that have created / work at / with start-up or emerging companies that include representatives of different industrial segments,</i> such as health, agro-food, photonics integrated circuits, energy, space and research markets, laser manufacturing, new materials, etc. Potential areas to have representation:</p> <ul style="list-style-type: none"> ▪ Medical (devises, diagnostics, therapies) ▪ Chips, Photonics Integrated Circuits ▪ Agrofood ▪ Energy ▪ Space ▪ Laser manufacturing ▪ New materials ▪ Illumination ▪ Vision ▪ Services and consulting ▪ CVs <p>Issues that could be addressed:</p> <ul style="list-style-type: none"> ▪ Challenges in entrepreneurship (in general, and specifically, in Photonics) ▪ Global perspective of Photonics ▪ How Photonics is used to address various challenges in a particular industry ▪ Advantages of Photonic technologies over the existing ones <p>Economic impact of Photonics</p>
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Annex 4: LIGHTtalks: The Power of Photonics profile by GoPhoton!



**LIGHT2015
PHOTONICS**
DISCOVER THE POWER OF LIGHT



ECOP
European Centres
for Outreach in Photonics

Description	A series of inspirational talks targeting industry focused on the multidisciplinary applications of photonics and their use in the industry. If within the LIGHT2015 project, it should take place coinciding with the IYL2015 Weekend of Light (25-28 September)
	<p>Photonics research is rapidly flowing from research centres and laboratories to be incorporated into industrial processes. The session will be composed of a series of experienced speakers delivering talks that illustrate how a broad spectrum of photonic applications can be used and bring value add to different industries. There will be a special focus on cross-disciplinary, cross-KET, and cross-sector applications.</p> <p>The session will focus on:</p> <ul style="list-style-type: none"> ▪ Expose the potential of Photonics in industrial processes and innovation. ▪ Emphasize the contribution of Photonics to the economy. ▪ Highlight the ubiquity of Photonics. ▪ Feature the increasingly central role of Photonics in areas such as Life Sciences, Quality Control, Agrofood and Cultural Patrimony.
Objectives	This series strive to reach new sectors and industries where photonics may be applied to unleash innovative potential, improving industrial processes and bringing new products to market. It aims to create awareness among industry members about the economic and industrial potential of photonics, thereby encouraging them to consider Photonics as an interesting field to integrate or to create new innovation areas in existing businesses.

<p>Structure</p>	<ul style="list-style-type: none"> ▪ <i>5 min</i> Introduction of the event and the speakers by the moderator. ▪ <i>20 min</i> Introduction about the power of photonics and its economic and technology impact. ▪ <i>50 min (5x10min)</i> Inspirational talks in pill format by each speaker (about 5 speakers). ▪ <i>45 min</i> Round table and Q&A session. <p>Distribute notes of paper that people can use to write their questions (and if possible names / company).</p> <p>Have a set of questions ready in case nobody asks (or to trigger the questions).</p> <ul style="list-style-type: none"> ▪ <i>60-90 min</i> Networking dinner.
	<p>Moderator: node's representative.</p> <p>Key note speaker: VIP profile (Partner's senior level representative): to provide the general context of the global photonics market.</p> <p>Potential Speakers: Group of speakers that are developing / doing research in photonics technologies with industrial applications as well as industry members that can explain how they are using photonics technologies in their company. Different industry segments should be present, such as health, agro-food, photonics integrated circuits, energy, space and research markets, laser manufacturing, new materials, etc.</p> <p>Issues that could be addressed:</p> <ul style="list-style-type: none"> ▪ Global perspective of photonics. ▪ How photonics is used to address various challenges in a particular industry. ▪ Advantages of photonic technologies over the existing ones. ▪ Economic impact of photonics.

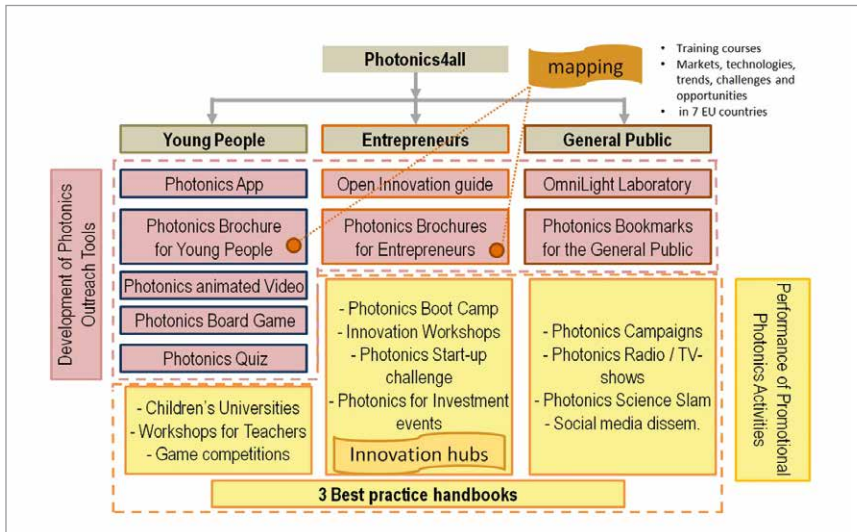
Annex 5: Overview and impact table for Photonics4All activities and tools targeted at the general public

Activity in Photonics4All	Target group = TARGET	Measurable aim = AIM	Required skills & infrastructure (things that one must have at hand and that not all organisations necessarily have = competence / material check) = BACKGROUND	Investment (quantification of Time, Money and involved Staff) = INVESTMENT			Estimated number of participants per event - e.g. for one workshop or one children's university = REACH	Estimated level of interaction with participants (low / medium / high) = ENGAGEMENT LEVEL (low = awareness raising, only little interaction with audience; medium = some interactions but only few individuals able to engage themselves; high = lots of interactions and most individuals able to engage themselves)	Estimated significance of the activity in term of change of knowledge and/or change of attitude, interest in photonics (low / medium / high) = SIGNIFICANCE	IMPACT (using low / medium / high scale) defined as REACH X SIGNIFICANCE	Gained experience in Photonics4All		Photonics4All results
				invested time (in hours) per activity / event	estimated cost / event in Euros excluding personnel costs	number of staff involved					Advantages	Disadvantages	
Boot camps	PhD students, young entrepreneurs, students	<ul style="list-style-type: none"> - provide participants with entrepreneurial (business creation and management) and innovation management skills to create new ventures – or to support existing businesses - help participants to build self-confidence and self-belief in order to apply those skills - working on real ideas in creative and practical ways - enable interaction with entrepreneurs and access to real cases 	<ul style="list-style-type: none"> - teaching entrepreneurship - event organisation skills - venue (including e.g. student accommodation) - contact network of universities on the one hand and young entrepreneurs (start-ups) on the other hand 	185	5,000	0-5	15-20	high	high	high	Strong interest from participants (students & young entrepreneurs)	Difficulty to fill in the sessions for the specific topic of Photonics, so that it is advisable to collaborate with existing events (like summer schools on entrepreneurship a.s.o.)	18 participants in the first boot camp, 1 start-up creation since the beginning of the project
Innovation workshops	SMEs, Start-ups, research organisations	initialized co-operation partnerships	a network in photonics with personal contacts to companies & RTOs, contacts to lectures, experience and knowledge in open innovation	40 per workshop	1,000 per workshop	1-3 per workshop	30	high	medium	high	<ul style="list-style-type: none"> - The organiser can collect feedbacks on SME's strategy in long-term - the workshops enable cross-sectoral innovation - networking sessions very successful 	impact difficult to measure (Photonics4All prepared templates to publish Innovation Offers & Requests and to document to be signed in case of partnership agreements but low usability of such tools)	6 innovation workshops with great success in regular working groups of regional cluster organisations and format/content adoption for further meetings, many potential partnerships (lots of listed ideas requiring follow-up in a few month time)

Activity in Photonics4All	Target group = TARGET	Measurable aim = AIM	Required skills & infrastructure (things that one must have at hand and that not all organisations necessarily have = competence / material check) = BACKGROUND	Investment (quantification of Time, Money and involved Staff) = INVESTMENT			Estimated number of participants per event - e.g. for one workshop or one children's university = REACH	Estimated level of interaction with participants (low / medium / high) = ENGAGEMENT LEVEL (low = awareness raising, only little interaction with audience; medium = some interactions but only few individuals able to engage themselves; high = lots of interactions and most individuals able to engage themselves)	Estimated significance of the activity in term of change of knowledge and/or change of attitude, interest in photonics (low / medium / high) = SIGNIFICANCE	IMPACT (using low / medium / high scale) defined as REACH X SIGNIFICANCE	Gained experience in Photonics4All		Photonics4All results
				invested time (in hours) per activity / event	estimated cost / event in Euros excluding personnel costs	number of staff involved					Advantages	Disadvantages	
Photonics Euro- pean Start-Up Challenge	Start-ups, young entrepreneurs	- number of start-ups supported, - number of publications reporting on the event	- personal contacts to sponsors, partners and start-ups, - good public relations and broad promotion network	175	5,000 without sponsoring	2	30	high	high	high	increasing awareness level (photonics community and investors), public acceptance of risk culture, idea of founding an own company	complex organization	- 4 partnership agreements shortly after the event, - a huge interest of the photonics community
Photonics for investment events (Venture summits)	Entrepreneurs (especially start-ups)	1) Allow the entrepreneurs to have: - improved pitching skills - contacts with investors during the event - individual meetings planned with them after the event - fundraise 2) Educate investors on the particularities and opportunities in Photonics businesses	- Good knowledge of photonics potential in different applicative sectors - Knowing your network of SMEs well - Good contacts with investors - Events organisational skills	210 for direct organisation	6,000 for 60 participants	0-5	Approx. 150 per event	high	medium (for investors)	high	Good ROI (lots of satisfied participants) Increase of investors' interest on Photonics, and increase of understanding of investors strategies for photonics SMEs.	Quite a heavy organization and high cost.	Results of one venture summit with 75 SME participants 6 months ago: 34 contacts between photonics SMEs and investors during the event, 14 business examined & 9 meeting planned between SMEs and investors
LIGHTtalks: „Photonics for investment“	Entrepreneurs (especially start-ups)	Contact with investors, technology sharing, exchange of experience among companies	Skills and venue for organizing events, personal contact to investors and partners (network of SMEs)	70	500-5,000 / event	2-3 per event	30-300	medium	medium	medium	Increase of business and investors' interest on Photonics	Need for high-quality lecturers, need for appropriate contacts among business partners	16 companies at 2 events

Annex 6: photonics4All in a nutshell

Photonics4All is a Horizon 2020 European Outreach project, funded by the European Commission¹⁴ to promote photonics to young people¹⁵, entrepreneurs¹⁶ and the general public¹⁷ across the EU. Photonics4All has developed a set of new promotional tools and applied them during a wide variety of outreach activities with different audiences.



Discover our unique approach and check out our tools and event at: www.photonics4all.eu!

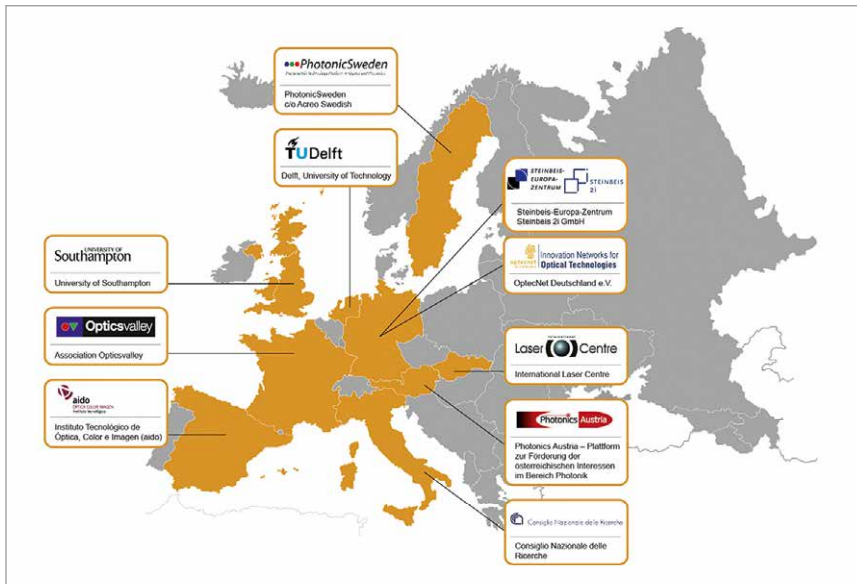
¹⁴ http://ec.europa.eu/index_en.htm

¹⁵ <http://photonics4all.eu/young-people/>

¹⁶ <http://photonics4all.eu/entrepreneurs/>

¹⁷ <http://photonics4all.eu/general-public/>

Annex 7: Photonics4All consortium & contacts



Nota Bene: The Spanish partner of Photonics4All, AIDO, went bankrupt during the project and thus, unfortunately, could only contribute to the project at the beginning

	Organisation	Contact person	E-mail	Address
1	Steinbeis-Europa-Zentrum, Steinbeis 21 GmbH	Robert Gohla Aude Pélisson-Schecter Dorothea Haas	gohla@steinbeis-europa.de pelisson@steinbeis-europa.de haas@steinbeis-europa.de	Erbrinzenstr. 4-12, 76133 Karlsruhe, Germany
2	Photonics BW / OptecNet	Johannes Verst	verst@photonicsbw.de	Anton-Huber-Str. 20, 73430 Aalen, Germany
4	Opticsvalley	Fiona Gerente Jonathan Baine	f.gerente@opticsvalley.org j.baine@opticsvalley.org	Boulevard Nicolas Samson 35, 91120 Palaiseau, France
5	PhotonicsSweden	Petra Bindig	petra@photonicsweden.org	Isafjordsgatan 22, 164 25 Kista, Sweden
6	Photonics Austria	Ulrich Trog	ulrich.trog@joanneum.at	Franz-Pichler-Straße 30, 8160 Weiz, Austria
7	Delft University of Technology	Aurèle Adam	A.J.L.Adam@tudelft.nl	Stevinweg 1, 2628 CN Delft, The Netherlands
8	University of Southampton	Pearl John	P.john@soton.ac.uk	Highfield, Southampton, SO 17 1BJ, United Kingdom
9	International Laser Center	Frantisek Uherek Dusan Chorvat	Fero@ilc.sk chorvat@ilc.sk	Ilkovicova 3, 841 04 Bratislava, Slovakia
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Today, optics and photonics technologies have an important impact on nearly every area of our lives, covering a wide range of applications in science and industry. Photonics has been recognized as a Key Enabling Technology (KET) by the European Commission. However, despite its importance photonics is still not well-known to a majority of people.

To challenge this general lack of awareness about photonics, the European Commission funded the Photonics4All outreach project which was designed to promote photonics and light-based technologies to young people, entrepreneurs and the general public throughout the EU. Between January 2015 and December 2016, 9 Photonics4All project partners developed a set of promotional outreach tools which were used successfully during a variety of different outreach activities with over 400,000 people. The project aimed to engage the target groups with photonics and photonics applications, and inspire a greater interest in photonics amongst all those taking part.

This handbook summarizes our best practices in promoting photonics and light-based technologies to both future and established entrepreneurs. The handbook is aimed mainly at those supporting Photonics Small and Medium-sized Enterprises (SMEs). The objective of the presented best practices is to increase the awareness of the various photonics technologies and related market that exist, so as to support and increase business creation in the field of photonics.

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