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## Photonics Digital Innovation Hub secures €19 million to boost SME growth and ensure Europe's global competitiveness

**PhotonHub Europe – a new pan-European photonics digital innovation hub – has been awarded €19 million investment from the EU's Horizon 2020 program. The PhotonHub Europe will help European SMEs and mid-caps become highly competitive digital businesses through faster and smarter deployment of photonics-based technologies, directly creating over 1.000 new high-tech EU jobs and nearly €1 billion in new revenues and venture capital by 2025. Fraunhofer Institute for Organic Electronics, Electron Beam and Plasma Technology FEP is pleased to be a joint partner within the PhotonHub Europe together with Fraunhofer HHI and ILT.**

The next year will start with some good news for photonics! In 2021 the promising innovation hub for photonics "PhotonHub Europe" will start up working and even three Fraunhofer-Institutes (Fraunhofer Institute for Telecommunications, Heinrich Hertz Institute, HHI; Fraunhofer Institute for Laser Technology ILT, Fraunhofer Institute for Organic Electronics, Electron Beam and Plasma Technology FEP) are pleased to be joint partners within the pan-European innovation hub, which aims to join European expertise, technology know how and facilities in order to accelerate the application of photonics technologies by European industry.

### High-Tech Facilities for Organic Opto-Electronics to Support PhotonHub Europe

Fraunhofer FEP will support PhotonHub Europe's industrial innovation activities with its know-how and expertise along the full value chain for (large area) organic electronic devices, like OLED for lighting and signage, organic solar cells, OPD and OFET. Fraunhofer FEP is able to design and prepare customer specific OLED lighting and signage modules. Furthermore, FEP is able to provide services like material evaluation (organic materials as well as substrates and encapsulation), process technology (patterning, evaporation, encapsulation), system integration and electro-optical characterization and reliability tests.

Dr. Christian May, division director for flexible organic electronics, explains the contributions in more detail: "Fraunhofer FEP contributes several well renowned researchers to PhotonHub Europe's pool of experts. We will also support project partners to prepare

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**Fraunhofer Institute for Organic Electronics, Electron Beam and Plasma Technology FEP**

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specialized or customized training courses for companies wishing to have dedicated or application-specific staff training. Our institute will also participate in the pilot line activities of the project. This includes providing support to companies planning to transfer early-stage prototypes (TRL5) to pilot manufacturing (TRL6-7). The main focus will be in the area of flexible OLED lighting and will be implemented through the LYTEUS Pilot Line. Scale-up to higher volumes (TRL7-8) will be achieved by transferring of pilot-scale processes to the industrial manufacturing partners of Fraunhofer FEP and LYTEUS.

Fraunhofer FEP extensively contributes to Technology Platform "Polymer based Optics" with its leading infrastructure for OLED processing. The institute operates several lines to provide services from R&D via prototyping up to small volume production:

- R&D and pilot line for rigid and flexible substrates in ISO class 4 clean room environment (200 × 200 mm<sup>2</sup> substrates) for organic opto-electronic devices
- A roll-to-roll OLED line fabrication for flexible substrates (foil width of 300 mm for metal, ultra-thin glass and polymer films) including small molecule vacuum deposition, inspection system and lamination under protective nitrogen atmosphere for the barrier film encapsulation
- State-of-the-art measurement equipment for electro-optical characterization of light emitting devices and displays (Autronic Melchers DMS 401, Instrument Systems ISP1000); industry standard equipment for lifetime measurements and environmental testing

### **The Power of Photonics – United within PhotonicsHub Europe**

Photonics – the science and technology of light – is a key digital technology that is radically transforming the traditional industrial base. Photonics technologies are being used to create and launch exciting new products in wide-ranging end-user application domains such as Health, Digital Infrastructure, Manufacturing, Safety, Security, Space & Defense, Agro-Food, Mobility & Energy.

Think of optical fibers which allow for faster and richer online communication and computing; optical sensors which monitor the quality of our food, air and water; photovoltaics which power green energy; lasers which facilitate high precision manufacturing and nanotechnology; new optical lenses with incredible features for machine vision to enable everything from non-invasive medical devices to autonomous vehicles and robotics. All powered by photonics.

"Photonics is essential to the functioning of new applications which are powering the new industrial wave – Industry 4.0 – and which are also critical to our ability to fundamentally address the enormous global societal and environmental challenges of our times", said Prof Hugo Thienpont, Director of Brussels Photonics (B-PHOT) at the Vrije Universiteit Brussel (VUB) and overall coordinator of PhotonHub Europe. "European industry needs to be at the forefront in innovating with photonics, making the most of

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our combined strengths across all parts of the innovation value chain, and working collaboratively across all member states, to support European business innovation and growth. This is the motivation behind the establishment of PhotonHub Europe which is directly building on top of over 15 years of previous European projects and collaborative efforts by all of the organizations involved in developing and integrating the infrastructure necessary for such a major undertaking”.

In order to accelerate the uptake and deployment of photonics technologies by European industry, PhotonHub will establish a single photonics innovation hub which integrates all of the best-in-class photonics technologies, facilities, expertise and experience of 53 top competence centers across Europe under one roof as a one-stop-shop solution with open access for any company anywhere in Europe that wants to innovate with photonics.

As a result, PhotonHub will provide European companies, in particular “non-photonics” SMEs and mid-caps that are first users and early adopters of photonics, with open access and guided orienteering through the PhotonHub front office in Brussels, across a broad range of services and capabilities covering:

- training and upskilling supports
- “test before invest” innovation support
- supports to find investment

### **Photonics Training and Upskilling Supports**

Training and upskilling supports to companies will cover both technology- and application-specific learning in photonics using lecture-based tutorials, hands-on lab-based training and “Train-the-Trainer” programs within the hub’s 40 Demo Centers and 10 Experience Centers throughout Europe, all coordinated for consistent standards of excellence under the umbrella of the European Photonics Innovation Academy of PhotonHub.

Commenting on the training supports, Prof. Peter O’Brien of the Tyndall National Institute at University College Cork in Ireland and leader of the training activities within PhotonHub Europe, said “Investing in workforce training is key to boosting innovation, especially helping “non-photonics” people become more skilled and knowledgeable in how to best exploit photonics technologies in their new products and applications. PhotonHub, through its European Photonics Innovation Academy, will not only open up the world-class facilities of our consortium partners for hands-on demos and training, but our training supports will be enhanced through online tools to include the extensive use of virtual training sessions and a digital catalogue of further photonics training opportunities from across the wider European academic and industrial ecosystem”.

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### **“Test Before Invest” Innovation Support**

“Test before invest” innovation support to companies will offer expertise and equipment for design, prototyping, experimentation, engineering and pilot production, with further guidance and seamless links to the industrial supply chain of manufacturing in Europe, all provided by Europe’s top research and innovation facilities offering the broadest possible range of photonics technologies covering the full value chain from early stage product concept to pre-market launch.

“Investing in innovation is risky, especially for smaller companies for whom photonics is a new technology where they have limited or no in-house expertise or equipment. PhotonHub can dramatically lower the barriers to innovation for these companies to start experimenting and expanding their use of photonics”, said Mr. Ewit Roos of PhotonDelta in the Netherlands and co-leader with the VUB of the “test before invest” innovation activities within PhotonHub Europe. “We have a pool of 500 of the best photonics experts from across Europe readily available to engage with companies on highly collaborative Innovation Projects aimed at Technology Readiness Level (TRL) acceleration from prototyping (TRL3-4) to upscaling (TRL5-6) to manufacturing (TRL7-8), complemented by targeted business coaching and IP advisory supports to the companies to further boost the market-readiness levels of their innovation activities, and all heavily subsidized for strongly committed companies”.

### **Supports to Find Investment**

PhotonHub will help companies innovating with photonics to find investment from suitable sources of venture capital or other private/public sources of growth capital to further boost their capabilities in bringing new photonics and “photonics-enabled” products faster to market. Describing the investment supports, Ms. Mayte Carracedo of FundingBox in Poland and leader of the investment support activities within PhotonHub Europe working alongside other key partners including TechTour and the European Photonics Industry Consortium (EPIC), said “Matching the right investors with the right innovators at the right times is key to successful business growth. Through PhotonHub, European SMEs will be able to access a comprehensive range of supports from online guidance and orienteering on sources of investment, to more intensive personalized investment-readiness coaching and investor matchmaking specially developed for European start-ups and scale-ups innovating with photonics and organized in close collaboration with major regional and European venture fora and deep tech Investor Days”.

### **Cross-Border Added Value and Pan-European Networking**

PhotonHub will uniquely support cross-border innovation activities of European companies, whilst simultaneously working closely with local photonics hubs representing

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18 European regions as additional partners in the consortium to further boost photonics innovation amongst SMEs at a localized level all over Europe. Commenting on the regional collaboration with PhotonHub Europe, Mr. Ziga Valic of Photonics France said, "Photonics is recognized across many European regions as a key digital technology which is central to industrial innovation and prosperity. As such, we are investing strongly at a regional level in developing a vibrant local ecosystem for photonics innovation which integrates all stakeholders from research institutes and innovation labs to SMEs and large enterprises. Linking our regional efforts to PhotonHub at the European level we believe is essential as it means we can offer local companies a fast and seamless route to the best expertise and technologies in photonics to match their needs, whether that is to be found locally, nationally or on a cross-border level".

PhotonHub Europe will work with the local photonics hubs from the "lighthouse regions" where photonics is already well established in order to develop best practice models for SME innovation support and to disseminate these best practices widely to support the development of new innovation hubs covering most regions of Europe. Referring to this key initiative, Dr. Roberto Pini of CNR National Research Council of Italy in the Tuscany region and another of the core partners in PhotonHub Europe, said "Our region has for many years now been developing and implementing its smart specialization strategy in photonics with strong success. Through PhotonHub, we are delighted to now be able to join forces and network with other European regions with a similar focus on photonics innovation and SME business growth to share our experiences, learn from each other, and make the cross-border innovation ecosystem even stronger".

PhotonHub will collaborate with key European associations such as the European Regions Research and Innovation Network (ERRIN) and the Assembly of European Regions (AER) to help disseminate the support model for photonics innovation and grow the pan-European ecosystem of local photonics hubs, as well as working closely with well-established pan-European SME support networks such as Enterprise Europe Network (EEN) and the European Business Network (EBN) to open up access to the photonics innovation ecosystem for all European SMEs.

"Our mission at EEN is to help ambitious SMEs to innovate and grow internationally, providing international business expertise with local knowledge through our local contact points in every country," said Ms. Barbara Andreani of EEN Brussels. "Our collaboration with PhotonHub via its coordinator VUB fits perfectly with our strategic objectives to accelerate innovation and digitalization by enhancing the SME outreach of the European Digital Innovation Hubs such as PhotonHub, and helping many more SMEs to access the hubs' digital testing infrastructures especially in a cross-border setting. We are also particularly delighted to see the strong involvement of the local photonics hubs in PhotonHub as it ties in with the expectations of strengthening coordination of the European network with regional policy for more localized cooperation and signposting to the best solutions for SMEs across our combined networks".

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Furthermore, through its close collaboration and alignment with the European Technology Platform for Public-Private Partnership between the EC, academia and industry – Photonics21 – on the strategy for photonics development in Europe, and by tightly linking the activities of PhotonHub with those of other European Digital Innovation Hubs through its digital community-building platform, PhotonHub will ensure fast user-friendly access for European SMEs to the broadest possible range of advanced photonics expertise and technologies on the European scale, covering the entire value chain from TRL3-8.

“Most critically, in these times of high uncertainty and disruption in global supply chains, photonics has become an even more important key enabling technology for the transformation of production methods in European manufacturing for increased competitiveness of local supply chains and the boosting of Europe’s technological sovereignty,” said Prof. Hugo Thienpont of the VUB and overall coordinator of PhotonHub. “By combining local proximity with cross-border added value, PhotonHub will be a critical accelerator for innovation, digital transformation and SME business growth in Europe and an essential source for powerful networking opportunities across a pan-European innovation ecosystem”.

PhotonHub Europe will commence operations from early 2021 and will be operating a continuous open call for companies to apply for its support services. Applications for support will be facilitated online through the PhotonHub website located at [www.photonhub.eu](http://www.photonhub.eu).

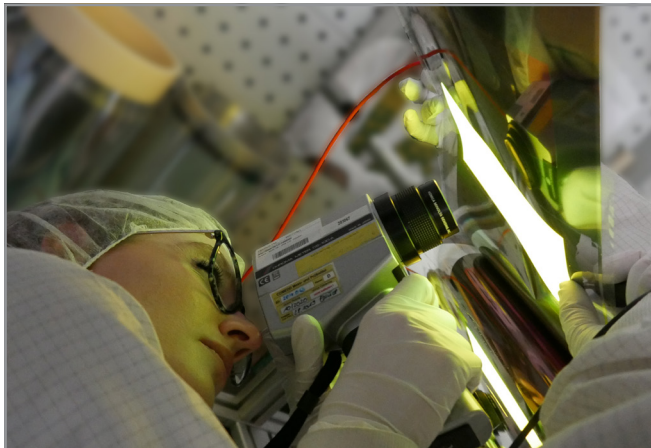
There are two important levels on which PhotonHub expects to deliver its impact. Firstly, on the digitization and competitiveness of end-user industry in Europe in particular SMEs through the uptake of photonics. In its first four years of operation, PhotonHub expects to achieve one-to-one expert discussions on photonics innovation ideas with at least 8.000 companies – 90% of which will be SMEs – with nearly 6.000 training engagements, 280 companies benefitting from investor matchmaking, and over 250 companies receiving cross-border innovation support for TRL acceleration. PhotonHub expects that these and other support activities will in that timeframe alone directly result in the creation of over 1.000 new high-tech EU jobs and nearly 1 billion euro in new revenues generated and new venture capital raised.

Secondly, PhotonHub will also measure its impact on the wider ecosystem of local photonics hubs in Europe, and in particular the leverage factor on regional and national funding for photonics innovation which is expected to add at least another 75 million euro on top of the EC funding, as well as implementing the business plan for sustainability of PhotonHub itself, which will continue to operate as the PhotonHub Europe Association long beyond the initial 19 million euro investment from the EC.

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**Inspection of flexible OLED processed with roll-to-roll technology at Fraunhofer FEP's facilities**

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Picture in printable resolution: [www.fep.fraunhofer.de/press](http://www.fep.fraunhofer.de/press)

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### List of the PhotonHub Europe partner organisations

NO.	PARTICIPANT ORGANISATION NAME	COUNTRY
1	Vrije Universiteit Brussel	Belgium
2	Center National de la Recherche Scientifique	France
3	Institute of Communication and Computer Systems	Greece
4	LioniX International	Netherlands
5	Nederlandse Organisatie voor Toegepast Natuurwetenschappelijk Onderzoek	Netherlands
6	University of Ghent	Belgium
7	Politechnika Warszawska	Poland
8	AIMEN Technology Centre	Spain
9	ALPhANOV - the Optics and Laser Technology Center	France
10	Laboratoire d'Electronique et de Technologie de l'Information	France
11	Conorzio Nazionale Interuniversitario per le Telecomunicazioni	Italy
12	Foundation for Research and Technology Hellas	Greece
13	Łukasiewicz Research Network – Institute of Electronic Materials Technology	Poland
14	Karlsruhe Institute of Technology	Germany
15	Leibniz-Institut für Photonische Technologie e.V.	Germany



16	LIGENTEC SA	Switzerland
17	Laser Zentrum Hannover	Germany
18	Research Institutes of Sweden	Sweden
19	SMART Photonics BV	Netherlands
20	Scuola Superiore Sant'Anna of Pisa	Italy
21	Universitat Politècnica de València	Spain
22	CARTIF	Spain
23	EL.En S.p.A	Italy
24	Leonardo	Italy
25	Fraunhofer-Gesellschaft zur Förderung der Angewandten Forschung e.V.	Germany
26	Technische Universiteit Eindhoven	Netherlands
27	Swiss Center for Electronics and Microtechnology	Switzerland
28	Interuniversitair Micro-Electronica Centrum VZW	Belgium
29	Teknologian Tutkimuskeskus VTT oy	Finland
30	Tyndall National Institute, University College Cork	Ireland
31	Consiglio Nazionale delle Ricerche	Italy
32	École Polytechnique Fédérale de Lausanne	Switzerland
33	Joanneum Research Forschungsgesellschaft mbH	Austria
34	Universitat Politècnica de Catalunya	Spain
35	Fundacio Institut de Ciències Fotoniques	Spain
36	University of Southampton Optoelectronics Research Centre – Centre for Process Innovation	United Kingdom

#### LOCAL PHOTONICS HUBS

37	Photonics France	France
38	PhotonDelta	Netherlands
39	Flanders Make	Belgium
40	Optec-Berlin-Brandenburg	Germany
41	OptoNet – Photoniknetzwerk Thüringen	Germany
42	Photonics Finland	Finland
43	Hellenic Photonics Cluster	Greece
44	Lazerinių ir inžinerinių technologijų klasteris	Lithuania
45	Polish Technological Platform on Photonics	Poland
46	Photonics Sweden	Sweden
47	Confindustria Toscana	Italy

#### BUSINESS SUPPORT PROVIDERS

48	24IP Law Group France SARL	France
49	AMIRES	Czech Republic
50	European Business Network (EBN)	Belgium
51	European Photonics Industry Consortium	Belgium
52	FundingBox	Poland
53	TechTour	Bulgaria

The **Fraunhofer Institute for Organic Electronics, Electron Beam and Plasma Technology FEP** works on innovative solutions in the fields of vacuum coating, surface treatment as well as organic semiconductors. The core competencies electron beam technologies, roll-to-roll technology, plasma-activated large-area and precision coating as well as technologies for organic electronics and IC design provide a basis for these activities. Thus, Fraunhofer FEP offers a wide range of possibilities for research, development and pilot production, especially for the processing, sterilization, structuring and refining of surfaces as well as OLED microdisplays, sensors, optical filters and flexible OLED lighting. Our aim is to seize the innovation potential of the electron beam, plasma technology and organic electronics for new production processes and devices and to make it available for our customers.