



## LASERLAB-EUROPE

### The Integrated Initiative of European Laser Research Infrastructures IV

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WP10 – Innovation Management and Industry Relations

Deliverable D10.4  
Report on relations with industry

Lead Beneficiary: 4 – CNRS

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<i>Deliverable Type</i>	
R = Report DEM = Demonstrator, pilot, prototype, plan designs DEC = Websites, patents filing, press & media actions, videos, etc. OTHER = Software, technical diagram, etc.	R
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## 1 Introduction and objectives

industrial and social impact, such as bio- and nanophotonics, (bio)material analyses, (bio)medical diagnosis and treatment, communication and data processing. This is reflected also in the fact that Photonics is recognised as a Key Enabling Technology within the framework of H2020. The objectives of this work package are to foster Laserlab-Europe's relations with industry and to implement supporting measures that will promote the use of laser RIs by industrial researchers, enhance technology and knowledge transfer and help to fully exploit the innovation potential of the participating research infrastructures.

Lead beneficiary: 4 CNRS

## 2 Framework

An Industrial Advisory Committee (IAC) has been set up at the start of the project and enlarged at mid-term. It now consists of eleven members, six of them from companies, both large and small, as well as of representatives of Laserlab-Europe partners with special interest and expertise in industrial relations and the project Coordinator. All members have been elected by the Laserlab-Europe General Assembly.

The IAC provides professional and technical input and advice in order to assist Laserlab-Europe in responding and adapting to exploitation opportunities and innovation needs. In collaboration with the IAC, Laserlab-Europe has organised two topical workshops to enhance exploitation and interaction with industry and medical centres. In addition, two events were organised with support of the IAC, dealing with more general industry-related aspects, one on how to exploit scientific results through the creation of start-up companies and one on exchange of experience in engagement with industry (for the latter, see D3.7).

At its regular meetings, the IAC discusses opportunities and needs for industrial involvement in Laserlab-Europe's activities in general, with particular focus on transnational vs. national access and access conditions for SMEs, collaboration of industry in the context of the Joint Research Activities, in topical workshops and in training activities.

## 3 Task 1: Industry Services

Task leader: CNRS-LP3

Laserlab-Europe offers a broad range of expertise and collaboration opportunities with industry and medical centres. Based on discussions of the Laserlab-Europe Networking Board and advice from the Industrial Advisory Committee, a web page 'Laserlab for industry' and an inventory of expertise are being developed. Commercial access in general needs to be promoted and made visible. For industry, the visibility of all facilities in Laserlab is interesting, not only the offer of the access providing facilities. According to the IAC, an inventory of expertise, e.g. a table "Where can you buy access to which service", would provide useful input as a "service for industry". In a second step, support can be provided on how to get access to this expertise.

A web page 'Services for industry' (<http://www.laserlab-europe.eu/industry-services>) has been set up with a confidential inquiry form to help and guide industrial partners regarding opportunities for industrial collaboration. Details about the initial web page are given in deliverable D10.1.

In order to develop an inventory of expertise, a questionnaire on industry relations was completed by a large number of Laserlab-Europe partners. The results have been analysed and need to be further refined in additional discussions and interviews, conducted by an external adviser, with the aim to identify gaps in the overall offer and to present the offer in a form that addresses the needs of companies appropriately and attractively. A first version of a table of competencies is presented on the webpage.

A summary of the analysis of the questionnaires and further work of the external adviser is given below.

## **Laserlab Europe Survey on Industrial Engagement and Analysis**

This work builds upon an earlier questionnaire that was used to capture the capabilities of the members and their desire to engage with industry. We have carried out a detailed analysis into how and with whom industrial engagement could be carried out and fed the results into a second members' survey.

The earlier survey of members identified a large number and variety of opportunities that each individual member offers to industry and highlighted a broad industrial engagement across many sectors. But the quality of information given varied between members and it was difficult to obtain a single view that could be easily communicated to industry. However, a single, easily understood view of what the network could offer to industry is very important for gaining the very first, early attention from companies upon which future relationships can be built.

Based on those points we needed to carry out additional work that provided a sound basis for developing an engagement and messaging strategy and implement relevant web content. The main elements of our work are listed below together with their outcomes.

### **Uniqueness of Laserlab Europe**

The network has longstanding experience in collaborating on challenging problems and, building upon this, the network could solve very challenging industrial problems in similar areas. This could include the whole research and development cycle from exploration to productisation, or some elements of it.

### **Best Practice Web Content and User Journey**

We looked at the information provided on different, but relevant webpages. We took the perspective of an employee of a company who is exploring R&D support from an academic community. From a number of websites we identified three that provided good examples, which Laserlab Europe could tailor to its own unique characteristics:

- **WayforLight:** we appreciated it for its contents, especially the content of the EARIV flyer.
- **STFC Diamond Light Source:** we appreciated it for the user journey experience.
- **Actphast:** we appreciated it for its clear communication of why companies should engage with it and how the engagement works.

### **Identification of Key Industry Sectors**

The total range of sectors that the Laserlab network engages with is vast. But because of limited resource and time available, we agreed to select five sectors according to three priorities: Research intensive sectors, industries that align with Laserlab Europe's work and European industry strengths. Based on the priorities and after a comprehensive desk research we selected the following industry sectors: Life Sciences & Health, Advanced Manufacturing, Automotive, Pharmaceutical and Chemical Industry, Aerospace Research.

### **Analysing People Likely to Engage with Laserlab Europe: Persona description**

To communicate opportunities that Laserlab Europe could offer to industry it is important to look at the type of person that we believe is likely to engage or we would like to engage so that we understand their motivations and needs. This is a standard technique used in product and service design and is helpful in developing a value proposition. The personas should be adopted over time, because situations and focus may change as well as an increasing knowledge about industry over time.

We have looked at three different types of personas: one type linked to large, multinational companies and two types associated with different SMEs. These were selected based on

experience of the type of engagement that research organisations have with industry and to align with the European policy to support its SME's and foster entrepreneurship.

We find that engagement with SMEs tends to be more difficult than with large, open innovation-oriented businesses. Considering the resources that are available to Laserlab Europe, we recommend that it initially focusses on large companies. Some consideration should be given to SMEs that have spun out from academia as they are more open to the benefits that science brings to them. Issues about funding the access and/or engagement should also be considered when dealing with SMEs.

### **Laserlab Europe – Industry engagement models**

An important part of communicating to industry is to understand and map the routes that interaction takes place. We assume that Laserlab Europe only has a role to play when a local member does not have the capability or capacity to fulfil the request. We have looked at a number of possibilities ranging from simple industry enquiry with minimal intervention from the Laserlab Europe Secretariat to the complex industry enquiry with maximal intervention from Laserlab Europe Secretariat.

### **Second questionnaire**

Our background work highlighted areas that required more in-depth information from the members. The main elements that we wanted to uncover were the following:

1. Verify the industry sectors we have prioritised and agree on a common language,
2. Verify offerings using a unified language (previously, the question was open and so led to a large variety of answers which essentially had the same meaning),
3. Identify potential case studies of collaboration,
4. Explore local and national innovation support such as funding that is available for academic industry collaborations,
5. Explore how members would like Laserlab Europe to help them engaging with industry.

We designed an online questionnaire which we sent to the member organisations and are collecting feedback on. What we have received so far, suggests the following:

1. Most members are active with industrial engagement.
2. Each response has been in a different industry sector, highlighting the wide applicability of the research to industry.
3. In most cases the engagement required the industrial partner to be looking for a collaboration – this suggests that we can grow the number of fresh collaborations with an outbound engagement plan.
4. Nearly all respondents reported that they did technology transfer (TT). There is a potential for Laserlab Europe to highlight TT opportunities. However, this requires a resource to actively collect these opportunities.
5. There have been no reported examples of Laserlab Europe members working jointly together with industry. Without any examples we have the risk that members are unaware of their potential and what benefits it can bring to industry. This could be mitigated through showcasing examples that could have applications in industry.
6. There is not a strong support for Laserlab Europe members to seek support from the core network for help with industrial engagement. Which highlights that Laserlab Europe members need to discuss, what they would like to achieve and what benefit Laserlab Europe could bring to them.

### **Recommendation**

Our main recommendation from this work is that Laserlab Europe's members discuss and agree on the role of the association in their engagement with industry. Included in this discussion needs to be a consideration of who will take responsibility for the activities and the boundaries of engagement such as, what is acceptable and what is not.

## 4 Task 2: Partnership Programme for Training Activities

Task leader: ILC

The involvement of industrial partners in Laserlab-Europe's training activities and events targeting young researchers is promoted. This is beneficial for both sides, bringing together commercial and academic research interests and needs and increasing the availability of highly trained staff in Europe. The activity is linked to WP5.

Examples for such an involvement are:

- The Training School on Laser Applications for Biology and Biomolecular Systems, Coimbra, Portugal, 3-7 July 2017 was sponsored by several companies (MTBrandão Precision Technology, Spectra Physics, iTheraMedical, Sarspec, ADLaser, LaserLeap) that contributed equipment and staff to the hands-on experimental sessions and lectures or sponsored invited distinguished speakers.
- The User Training Workshop on Time-Resolved Techniques (TReT), 20-22 June 2018, Biocev, Vestec, Czech Republic was supported by in-kind contribution from Becker-Hickl, GmbH Berlin, Carl Zeiss sro, Prague and Pragolab sro, Prague. These manufacturers and distributors of systems for time-resolved detection provided lectures from companies and sent delegate users to the workshop.
- The Laser-plasma physics and applications summer school (LaPlaSS), 17-21 September 2018, Salamanca, Spain was supported by the company Photon lines through training in analysis of fast phenomena by means of imaging in the time domain covering from picosecond to millisecond.

## 5 Task 3: Innovation Forum

Task leader: STRATH

With support from the Industrial Advisory Committee, Laserlab-Europe has set up an Innovation Forum to facilitate exchange between stakeholders from academia and industry. Two dedicated workshops addressed issues such as technology bottlenecks, opportunities for industry to engage in research at an early stage, opportunities for industry to use the facilities to develop and test concepts, and discuss protection of intellectual property in the context of academic openness, in addition to two events dealing with more general aspects, one of these in the framework of the Laserlab-Europe conference (see D3.7). The following workshops have been held:

*Metrology of high power ultra-short pulse lasers: user and supplier perspectives, 10 May 2017, Berlin, Germany*

A Laserlab-Europe workshop on the "Metrology of high power ultra-short lasers: user and supplier perspectives" was organised in close collaboration with the Industrial Advisory Committee. The event included participants from across both academic and industrial sectors, with a total attendance number of about 50 people. The workshop focussed on characterisation and metrology techniques that are used to determine the parameters of high-power, ultra-short laser pulses, and discussed the need for developing metrology standards in this area. The workshop was divided into three sessions on: 1) pulse duration measurements, 2) laser intensity measurements, and 3) metrology. The main objective was to facilitate discussion through a joint workshop involving users and suppliers, to consider the primary requirements that characterise the performance of high-power ultra-short pulsed lasers. The workshop also aimed to provide an overview on metrology standards and the traceability of measurements, and considered the potential of establishing a future activity to coordinate and develop this area.

Details are reported in deliverable D10.2.

*Best practice for turning scientific results into innovative products and companies, 11 May 2017, Berlin, Germany*

A workshop on “Best practice for turning scientific results into innovative products and companies” was organised in collocation with a Joint JRA Meeting. The aim was to bring together scientists working in the Laserlab-Europe JRA and representatives of “young” successful spin-off companies, providing examples of successfully starting companies with scientific results, overcoming obstacles and, thus, stimulating Laserlab scientists to follow these examples. During the workshop, three founders of young spin-off companies presented their success stories, complementing each other by giving examples from innovation development in life sciences and from laser systems providers. These examples were followed by a talk of the manager of an innovation service centre that supports scientists in all questions of technology transfer, exploitation and the creation of new companies. The talks met with great interest from the participants and led to many questions and lively discussions.

*Visions on Future Laser-based X-ray Science and Technology, 19-20 November 2018, Castelldefels (Barcelona), Spain*

A Laserlab-Europe foresight workshop “Visions on Future Laser-based X-ray Science and Technology” was held at ICFO – The Institute of Photonic Sciences in Castelldefels (Barcelona), Spain – aiming to assess state-of-the-art technologies and discuss visions for future opportunities in laser-based X-ray science through development of technologies and novel methods for scientific investigation (see WP7). Part of this workshop, a session on industrial perspectives, was dedicated to providing a platform to enable industry to learn about new research opportunities and to help facilitate engagement in ongoing research and examine technology bottlenecks, while disseminating recent developments within their companies and secure contacts for future collaboration.

The two-day workshop was attended by more than 80 participants, comprising leading scientists from Laserlab-Europe laboratories, other European and international institutions and representatives from industry. The event created a unique opportunity for interaction between academia and industry in the field of laser-based X-ray science and technology.

The workshop was divided into three main sessions, covering state-of-the-art scientific applications, sources, and the requirements of industry. At the end of each day, a round table session provided for lively discussions about opportunities for future collaboration and synergies between the communities as well as options for industrial involvement.

The workshop enabled an open discussion on advanced X-ray sources for research and industrial applications. The talks provided an overview of laser-driven X-ray sources and considered the needs and requirements of both academic and industrial research. The discussion sessions clearly highlighted the challenges in developing appropriate technologies and indicated that there is a need for a review of requirements of all industrial sectors and academic research where X-ray sources are used as tools for advanced research. Future activities could include a review of sources and the requirements of industry and academia.

Details are reported in deliverable D10.3.