



## LASERLAB-EUROPE

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

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WP4 – Scientific and Technological Exchanges

Deliverable 4.1

Intermediate report on “Technical bridge workshops”

Lead Beneficiary: 4 – CNRS

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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 Objectives

The combined scientific and technical expertise of the project participants is a core asset of Laserlab-Europe, making it highly attractive for users and supporting a leading role of European science in photonics research. The objectives of Work Package 4 – “Scientific and Technological Exchanges” are i) to coordinate exchange on crucial scientific and technological issues of relevance for many partners, ii) to address the multidisciplinary applications of lasers and photonics technologies by bridging towards other ESFRI infrastructures and relevant networks, and iii) to pool know-how and good practice concerning essential operational issues such as security, laboratory management and data acquisition procedures.

The outcome of this scientific and technological networking will be increasingly unified efforts from all members of the Consortium, pushing forward laser science and technology in the European Community at large, as well as strong links with related networks and infrastructures such as ELI, Synchrotrons, Free-Electron Lasers (FELs) and life science networks. Two FELs have become members of Laserlab-Europe already and reinforce the collaboration and exchange with this community.

## 2 Task 1 – “Bridge” Workshops

The role of lasers and laser-like sources in modern science and technology is increasing steadily, creating new kinds of infrastructures and pan-European projects, such as ELI and XFEL. Laserlab-Europe promotes clustering and coordinated actions to initiate cross-fertilization with these new infrastructures, in order to avoid duplication of efforts and to strengthen cooperations. Under Task 1 of WP4, cross-disciplinary workshops are organised aiming at creating scientific and technical bridges with other communities, mainly in the framework of MoUs with ELI and FELs of Europe and in the collaboration in EUCALL, the H2020 cluster project “European Cluster of Advanced Laser Light sources”.

Lead partner: CNRS-CELIA

### ***Science@FELs Conference, Trieste, Italy, 5-7 September 2016***

The first “bridge” workshop was the international Science@FELs Conference, organised by Elettra - Sincrotrone Trieste. Science@FELs is a biennial conference organised by FELs of EUROPE. Science@FELs 2016 focussed on the scientific highlights achieved during the last years in the fast evolving development and operation of laser sources that are enabling experiments at shorter wavelengths, adding element and chemical state specificity by exciting and probing electronic transitions from core levels.



Laserlab-Europe took part in the organisation of the 2016 conference with the aim to stimulate more extensive cross-fertilisation and collaboration between the two communities, i.e. those working with lab-scale lasers and FELs, respectively. A ‘Laser Physics’ session

was included in the conference, organised by Laserlab-Europe representatives, which started with an introduction on complementarities between FELs and lab-scale sources.

In collaboration with the European Cluster of Advanced Laser Light Sources (EUCALL), Young Researcher Travel Bursaries were awarded to young researchers to attend the conference. Emphasis was placed on enhancing participation of young researchers from the optical laser community.

In view of the increasing relevance of the collaboration of the optical laser community and the FEL community, the cooperation in organising conferences jointly will be continued, e.g. in the Science@FELs Conference 2018, Sweden.

### ***Building a Target Network for Advanced Laser Light Sources, 29-31 August 2016, Dresden, Germany***

In the next few years a number of pan-European advanced laser light user facilities will become available for the scientific community, promising major breakthroughs for high energy density physics, relativistic laser plasmas, high pressure science, planetary and astrophysics, advanced accelerators and study of materials under extreme conditions. Most of these facilities will give the possibility of performing high repetition rate experiments, typically in the 1-10 Hz range, corresponding to a requirement of thousands of targets per day. Therefore, target availability could very likely become a limiting factor preventing the exploitation of the full potential of advanced laser and X-ray facilities. The development of a target network for advanced laser light sources would be a strategic asset to ensure the availability of state of the art targets and to promote the formulation of common strategies to address issues related to target delivery and irradiation at high repetition rate.

An initiative endorsed by EUCALL and Laserlab-Europe aims at raising awareness on target issues, and at promoting joint efforts to enable high repetition rate experiments and establish sustainable target supply mechanisms for advanced laser facilities. A coordinated action on targets will increase the potential for scientific achievements obtainable at new user facilities and, eventually, be beneficial for the whole community.

A joint workshop was organised at Laserlab-Europe partner Helmholtz-Zentrum Dresden-Rossendorf, with the following main goals:

- assessing target needs and current target supply strategies
- discussion of a strategy to develop a target fabrication and characterization network
- production of a joint "white paper"



These themes were discussed by more than 70 users, target fabrication experts and representatives of user facilities. The next steps towards the development of a target network are proposed to be

- the discussion of possible synergies between laser facilities;
- the publication of an extended summary of the workshop discussions;

- the formation of an expert panel to help defining the network mission, access model, appropriate funding tool activities and to produce a white book document aimed at raising awareness about target needs and issues at the EU and national funding agencies (support grant writing for endorsing partners).

### Outlook

The Laserlab-Europe Networking Board has selected the Science@FELs 2018 conference as the next “bridge” workshop. Laserlab-Europe will participate in the organisation and appoint a representative to the programme committee. The announcement of the event is available at <https://indico.maxiv.lu.se/event/476/>.

#### *Science@FELs 2018*

The International Science@FELs Conference, organized by the Department of Physics, Stockholm University together with SUFEL (Stockholm-Uppsala Centre for Free Electron Laser Research), the MAX IV Laboratory and the Lund Laser Centre, will take place June 25-27, 2018, at the Alba Nova center in Stockholm, Sweden. This will be the fourth conference in the Science@FELs series, following those in Trieste in 2016, at the Paul Scherrer Institute in 2014, and at DESY in 2012. Science@FELs is now organized as a regular, biennial activity of the Collaboration of European FEL and SPS Facilities (FELs OF EUROPE). Just like in Trieste, Laserlab-Europe will take part in the organization of the Science@FELs conference in order to stimulate collaboration between the two communities.

