



LASERLAB-EUROPE

The Integrated Initiative of European Laser Research Infrastructures IV

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Work package 2 – The Virtual Laser Infrastructure

Deliverable D2.2

Final report on the Virtual Laser Infrastructure

Lead Beneficiary: 7 – FVB

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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
<i>Dissemination Level</i>	
PU = Public, fully open, e.g. web CO = Confidential, restricted under conditions set out in Model Grant Agreement CI = Classified, information as referred to in Commission Decision 2001/844/EC	PU

1 Objectives

The aim of Work Package 2 is to present Laserlab-Europe as a “Virtual Laser Infrastructure”, reflecting the integrated offer of the Consortium. The approach maps the essential organisational and networking functions onto a common internet platform, allowing the network to act and appear as a functional unit with respect to all relevant activities like management, networking, access, and research. The Laserlab-Europe web platform provides the technological basis for vital functions such as interactions with users, especially to manage the submission and evaluation of proposals for experimental projects in the framework of the transnational access programme, external communication with all interested communities and the public through the web presence of the Consortium, and all intra-consortium management of data.

One of the most important aspects is the dynamic evolution of this structure, i.e. the ability to quickly react to new requirements regarding new or altered projects, services, communication channels, etc. This is ensured by a professional and flexible design, central maintenance of the hard- and software, and professional full-time staff for maintenance, implementation of changes and new services.

2 Task 1 – Online Access Management System

Task leader: FVB-MBI, in close cooperation with the Access Board.

The Access Activity is organised as a joint activity among all participating infrastructures, using a common advertising platform on the internet, a common call for proposals, a unified proposal processing scheme, a common external Selection Panel, and a common external pool of referees.

The online Access Proposal Management System is based on software developed specifically for this purpose, involving a complex sequence of information exchange and processing as well as clearly defined “groups” with individual information access rights and restrictions (Users, Infrastructures, Selection Panel, Referees). Linked to the Access Proposal Management System are an online access reporting database, which collects the relevant information on access projects for all reporting and documentation purposes, a database for publications resulting from access projects, and the Laserlab-Europe User Questionnaire system, which is used for monitoring and quality assessment of the access programme as a whole and of the services provided by the individual facilities. (Assessment of the feedback from users is made within WP6).

The systems have been implemented in the predecessor project Laserlab-Europe and are highly appreciated among the participants of the project. Therefore, only minor adjustments and upgrades were implemented during the present project. The new access providing facilities have been included in the system from the start of the project. Maintenance of the system is taking place regularly. Regular updates of the underlying server operation programmes (open source operating system (Debian GNU/Linux) and other software) were performed, and adjustments of the proposal management system were made in order to improve the usability for applicants and project partners. Tools for analysis and statistical evaluations as well as automatic display routines for access-related documentation were implemented or improved.

The system is hosted and maintained at FVB-MBI with support from an external IT service company.



Fig. 1: Online Access Proposal Management System – start page for applicants



Fig. 2: Online Access Proposal Management System – administrative view of the internal features

3 Task 2 – Content Management System

A Content Management System (CMS) is used for the Laserlab-Europe website, which allows for remote contribution to the creation of web pages and provision of information by all participants, as they do not need to be familiar with any programming languages for internet publishing and design. The CMS, based on the open source programs Zope and Plone, is used for decentralised authoring, editing and publishing of information on the external and internal project web pages and for the provision of workflow functions for organizing and representing project-related processes. Most project activities like networking, access organisation and the overall management, controlling and administration of the network as a whole have dedicated intranet sections.

Maintenance and update of the CMS as a central feature for the entire network is provided by the Laserlab office and its staff. Reading and writing access to the external and internal

project web pages is granted to all project participants. Throughout the duration of the project, the system has been updated to be compatible with new developments in the internet environment, e.g. new versions and features of browsers, and complementary features for the CMS have been installed to improve its security (e.g. upgrade to secure communications protocol) and usability. A major update provides for usability of the webpage and an updated layout.

Information for visitors and clients on access services, on scientific and structural details of Laserlab-Europe and its activities in joint research and networking, for example on training possibilities and workshops, as well as on the de-centralised partner facilities is presented in form of a classical world wide web (www) presence (www.laserlab-europe.eu), set up with the Content Management System. The web presence helps to promote the visibility of the Laserlab Consortium as European point of contact for laser-based research and to increase the general awareness of the achievements and opportunities offered by Laserlab-Europe. The web presence addresses a very broad audience, from the general public, to fellow scientists, potential users of laser-based tools in very diverse scientific fields, and to the regional, national and European public organisations.

Special emphasis is put on offering access to the scientific community as a unified and joint activity among the partners, including external refereeing and selection processes. In addition, previous access user projects and their scientific output as well as “access success stories” are publicised and documented on the project’s webpage. This is of particular interest for potential users, who have access to a single portal allowing them to learn about the technical capacities of the various Laserlab infrastructures and to find examples of successful access projects.

The initial updated presentation of the project, including new participants, new joint research programmes and new access opportunities, was available on the public webpage at the start of project. All information on activities and results is continuously updated throughout the duration of the project in order to address new communities and improve the usability and value for external interested parties.

Laserlab Europe

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Laserlab-Europe - The Integrated Initiative of European Laser Research Infrastructures

Laserlab-Europe has entered a new phase of its successful cooperation: the Consortium now brings together 33 leading organisations in laser-based inter-disciplinary research from 16 countries. Together with associate partners, Laserlab covers the majority of European member states. 22 facilities offer [access to their labs](#) for research teams from Europe and beyond.

Lasers and photonics, one of five key enabling technologies identified by the European Union, are not only essential for the scientific future but also for the socio-economic security of any country. Laser technology is a key innovation driver for highly varied applications and products in many areas of modern society, thereby substantially contributing to economic growth. Laserlab-Europe aims to strengthen Europe's leading position and competitiveness in this key area. The main objectives are:

- To promote, in a coordinated way and on a European scale, the [use of advanced lasers and laser-based technologies](#) for research and innovation,
- To serve a cross-disciplinary user community, from academia as well as from industry, by providing [transnational access to a comprehensive set of advanced laser research facilities](#), including two free-electron laser facilities, in a highly co-ordinated fashion,
- To increase the European basis of human resources in the field of lasers by [training new users](#),
- To improve human and technical resources through [technology exchange](#) and sharing of expertise among laser experts and operators across Europe, and through coordinated [Joint Research Activities](#) enabling world-class research, innovations and applications beyond the present state-of-the-art.

Map of Europe showing Laserlab facilities locations: STRATH, LLAMA, MBI, FELIX, HZDR, MUT, ULLC, VULRC, CLF, GSI, HIJ, PALS, LULI, SLIC, LASERIX, LOA, ISMO, MPQ, ILC, CESTA, CELIA, CUSBO, FERMI, USZ, INFLPR, CLP, CLPU, ICFO, LP3, LENS, ULF-FORTH, IST.

Fig. 3: Public webpage implemented with CMS Zope/Plone by FVB-MBI.

Access Projects

Filter by

Project ID	Title	Applicant	Year	Home institute
CLF002562	Investigation of Excited State Dynamics of a conjugated polyelectrolyte self-assembled with ss-DNA	Sophia Charalambous Hayes	2019	University of Cyprus
CLF002563	Spherical aberration correction using adaptive lenses for optical tweezers microscopy	Stefano Bonora	2019	CNR-IFN
CLF002564	Fast 3D imaging and combined aberration correction using adaptive lenses for ER Single particle trajectories	Stefano Bonora	2019	CNR-IFN
CLF002565	Using TRIR and TA to unravel the mechanism leading to population of the excited states in BODIPY Polymers with Dual Applications: Antimicrobial Agents & Photosensitisers for H2 Generation	Mary Pryce	2019	DCU
CLF002566	Ultrafast Dynamics of Ruthenium Polypyridyl Vibrational Stark Probes in Solution and Bound to DNA	Susan Quinn	2019	University College Dublin
CNRS-CELIA002413	Induction and Observation of Transient Chirality in an Achiral Molecule	Jason Greenwood	2019	Queen's University Belfast
CNRS-CELIA002523	Controlling and resolving the photoionization dynamics of chiral molecules with a bilinear two color field	Nirit Dudovich	2019	Weizmann Institute of Science
CNRS-CELIA002572	Photon emission during relaxation of hot electrons and holes in wide-band-gap crystals	Andrey Vasilev	2019	Institute of Nuclear Physics of Moscow State University
CNRS-CELIA002573	Study of the interaction and conversion of electronic excitations in insulators under intense laser excitation	Dmitry Spasskiy	2019	Skobeltsyn Institute of Nuclear Physics, Lomonosov Moscow State University
CNRS-LP3002460	Understanding the physics and chemistry of fs-laser induced damage threshold	Doina Craciun	2019	National Institute for Laser, Plasma, and Radiation Physics
CNRS-LP3002491	Analysis of the impact of classical polishing methods on the composition of optical glass surfaces via laser-induced breakdown spectroscopy	Christoph Gerhard	2019	Technische Hochschule Wildau
CNRS-LP3002580	Sodium Analysis on Foods by Using Calibration Free-Laser Induced Breakdown Spectroscopy Technique	BANU SEZER	2019	NANOSENS Enhanced Technologies Energy Machine Project Design Consultancy Industry and Trade Inc.
CNRS-LP3002585	All-inorganic perovskite films deposited by laser ablation: free-calibration LIBS to determine the target composition for the right film stoichiometry	Anna Paola Caricato	2019	Department of Mathematics and Physics 'E. De Giorgi', University of Salento
CUSBO002475	Biofeedback Augmented Software Engineering: cognitive and autonomic neural manifestations captured using wearable sensors for reliable software development	Paulo de Carvalho	2019	Universidade de Coimbra
CUSBO002482	Characterization and manufacturing of phantoms for imaging scenarios in presence of turbid media	Enrique Tajahuerce	2019	Universitat Jaume I
CUSBO002516	An ex vivo study of change in optical properties with radiofrequency ablation	Francis Kallor Joseph	2019	University of Twente
CUSBO002554	Measuring optical properties of infant tissue mimicking optical phantoms and infant tissue in vivo	Stefan Andersson-Engels	2019	Tyndall National Institute
CUSBO002577	Time Resolved Diffuse Optical Spectroscopy for non-invasive analysis of tissues and organs	Sara Mosca	2019	CLF, RAL, STFC
CUSBO002598	Ultrafast transient absorption of adamantyl-phenol and the formation of quinone methide	Silvije Vdovič	2019	Institute of Physics
FELX002605	IR signatures of homo- and hetero-chiral 1-Methoxy-2-Propanol dimers studied with RMPD-VUV action spectroscopy	Vitali Zhaunerchyk	2019	Department of Physics, University of Gothenburg

Fig. 4: List of access projects performed at Laserlab facilities.

Access Publications

Project ID	Title	Authors	Reference	Year	Type of Publication	DOI or web address
LLC002276	Single-shot extreme-ultraviolet wavefront measurements of high-order harmonics	Dacasa, H., H. Coudert-Alteirac, C. Guo, E. Kueny, F. Campi, J. Lahl, J. Peschel, H. Wikmark, B. Major, E. Malm, D. Aili, K. Varjú, C. L. Arnold, G. Dovillaire, P. Johnsson, A. L'Huillier, S. Maclot, P. Rudawski and P. Zeitoun	Opt. Express 27, 2656	2019	Scientific Journal	https://doi.org/10.1364/OE.27.002656
ULF-FORTH002225	Two-color studies of CH3Br excitation dynamics with MPI and slice imaging	Hafildason, A., P. Glodic, G. Koumariou, P.C. Samartzis and A. Kvaran	Phys. Chem. Chem. Phys. 21, 10391	2019	Scientific Journal	https://doi.org/10.1039/c8cp06376a
LLAMS002300	The Evaluation of Time-Resolved Raman Spectroscopy for the Suppression of Background Fluorescence from Space-Relevant Samples	F. Hanke, B. J. A. Mooij, F. Ariele, U. Böttger	J Raman spectrosc. in press	2019	Scientific Journal	http://dx.doi.org/10.1002/jrs.5586
LUL100TW002189	Enhanced laser-driven proton acceleration using ultrasmall nanoparticles	S. Vallières, M. Barberio, M. Scisciò, E. d'Humières, and P. Antici	Phys. Rev. Accel. Beams 22, 091303	2019	Scientific Journal	https://doi.org/10.1103/PhysRevAccelBeams.22.091303
LUL100TW002184	Enhanced relativistic-electron beam collimation using two consecutive laser pulses	S. Malko, X. Vaisseau, F. Pérez, D. Batani, A. Curcio, M. Ehret, J. Honrubia, K. Jakubowska, A. Morace, J.J. Santos and L. Volpe	Scientific Reports 9, 14061	2019	Scientific Journal	https://doi.org/10.1038/s41598-019-50401-y
FELX002305	Acid solvation versus dissociation at "stardust conditions": Reaction sequence matters	Mani, D., R. Pérez de Tudela, R. Schwan, N. Pal, S. Körning, H. Forbert, B. Redlich, A. F. G. van der Meer, G. Schwaab, D. Marx and M. Havenith	Sci. Adv. 5, eaav8179	2019	Scientific Journal	https://doi.org/10.1126/sciadv.aav8179
FELX002310	Hydrogen tunneling avoided: enol-formation from a charge-tagged phenyl pyruvic acid derivative evidenced by tandem-MS, IR ion spectroscopy and theory	Mathias, Paul Katrin, Peckelsen Thomas, Thomulka Jörg, Neudörfel Jonathan, Martens Giel, Berden Jos, Omens Albrecht, Berkessel Anthony, J.H.M., Meijer Mathias, Schäfer	Phys Chem Chem Phys. 21, 16591-16600	2019	Scientific Journal	https://doi.org/10.1039/c9cp02316j
CNRS-LP3002150	Analysis of Multi-elemental Thin Films via Calibration-Free Laser-Induced Breakdown Spectroscopy	Hermann, J., E. Axente, F. Pelascini, V. Craciun	Anal. Chem. 91, 2544-2550	2019	Scientific Journal	https://doi.org/10.1021/acs.analchem.8b05780
LLAMS002356	Single-molecule polarization microscopy of DNA intercalators sheds light on the structure of S-DNA	Backer, A. S., A. S. Biebricher, G. A. King, G. J. L. Wuite, I. Heller, and E. J. G. Peterman	Science Advances 5, eaav1083	2019	Scientific Journal	https://doi.org/10.1126/sciadv.aav1083
SLIC002405	Computed stereo lensless X-ray imaging	Duarte, J., R. Cassin, J. Huijts, B. Iwan, F. Fortuna, L. Delbecq, H. Chapman, M. Fajardo, M. Kovacev, W.	Nature Photonics 13, 449-453	2019	Scientific Journal	https://doi.org/10.1038/s41566-019-0419-1

Fig. 5: Online database for publications resulting from access projects.

4 Task 3 – Testing and Establishing New Communication Channels

In order to improve time- and cost-saving communication between the participants the use of virtual meetings tools such as video conferencing, web meetings and web-based collaboration was expanded. Several board meetings have been held as telephone and web conferences or with partial participation through video conferencing.

Web-based collaboration and shared systems for document management for the coordination of tasks were used by subgroups in different work packages.