



## LASERLAB-EUROPE

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

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Work package 2 – Publicity and Dissemination

Deliverable D2.6  
Laserlab-Europe Conference

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<i>Deliverable Type</i>		
R	Document, report	OTHER
DEM	Demonstrator, pilot, prototype	
DEC	Websites, patent fillings, videos, etc.	
OTHER		
ETHICS	Ethics requirement	
ORDP	Open Research Data Pilot	
DATA	data sets, microdata, etc.	
<i>Dissemination Level</i>		
PU	Public, fully open, e.g. web	PU
CO	Confidential, restricted under conditions set out in Model Grant Agreement	



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## 1 Introduction to Laserlab-Europe

Laserlab-Europe is the European consortium of major national laser research infrastructures, covering advanced laser science and applications in most domains of research and technology, with particular emphasis on areas with high industrial and social impact, such as bio- and nanophotonics, material analyses, biology and medicine.

Recently the field of advanced lasers has experienced remarkable advances and breakthroughs in laser technologies and novel applications. 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. Through its strategic approach, Laserlab-Europe aims to strengthen Europe's leading position and competitiveness in this key area. It facilitates the coordination of laser research activities within the European Research Area by integrating major facilities in most European member states with a long-term perspective and providing concerted and efficient services to researchers in science and industry.

## 2 Objectives of the Laserlab-Europe conference

In the framework of the project's communication and outreach activities, the conference plays an outstanding role to promote the importance of Laserlab-Europe and its achievements, to increase the general awareness of the opportunities offered by the Consortium, and to communicate them to a very broad audience, from the general public, to fellow scientists, potential users of laser-based tools in very diverse scientific fields, and to regional, national and European public organisations. In addition, the conference, foreseen to be organised towards the end of the project period, intends to showcase Laserlab-Europe's results from joint research as well as access highlights, spreading information and knowledge among all members of the Consortium and among the laser research community at large. Invited external speakers and sessions devoted to healthcare and industry enhance dissemination and exploitation within the laser community and beyond.

## 3 Laserlab-Europe conference in Lisbon, Portugal

### 3.1 Format and programme

On 27-29 May 2024, Laserlab-Europe organised the Laserlab-Europe conference in Lisbon, Portugal, hosted by the Instituto Superior Tecnico. More than 100 participants from Europe and North America attended the three-day event.

In order to attract a broad audience, it was decided to merge a general outreach event with a user meeting and a public joint JRA meeting. A programme committee, representing the access and JRA activities of Laserlab-Europe, the Industrial Advisory Committee, and the expert groups of the network, identified relevant topical areas. Users of the transnational access programme and industrial representatives were actively involved in the programme setup.

The members of the programme committee were:

- Marta Fajardo, IST
- Goncalo Figueira, IST
- Rodrigo Lopez-Martens, LOA



- Andrea Bassi, POLIMI
- Rosa Romero, Sphere Ultrafast Photonics
- Rosa Weigand, UCM, User Representative
- Marc Vrakking, MBI
- Sylvie Jacquemot, LULI
- Daniela Stozno, Laserlab-Europe office
- Ramona Landgraf, Laserlab-Europe office

The programme committee proposed the following five session topics:

- Session 1: Lasers for catalysis
- Session 2: Attoscience
- Session 3: Lasers in a multi-instrumental world
- Session 4a: Lasers for health - Lasers for oncology
- Session 4b: Lasers for health - Lasers for imaging and diagnosing life
- Session 5: Lasers and laser-based instruments for the future

All sessions included talks from Laserlab-Europe representatives on recent developments resulting from joint research activities, talks from users of the transnational access programme on access highlights and talks from companies' representatives giving an outlook on development needs and opportunities from an industrial perspective. At the end of each session, ample time was provided for discussion with the speakers, which was actively used.

Session chairs were identified among the Laserlab-Europe partners, who were asked to support the composition of their sessions and to invite speakers from outside Laserlab-Europe at the top of their respective field.

The conference was fully open to participants from outside Laserlab-Europe. For interested companies, exhibition space was provided with stands showcasing their innovations. In view of the venue in the Iberian Peninsula, in particular regional industrial representatives were invited to present, exhibit, and participate in the conference.

On the first day, Sylvie Jacquemot, the coordinator of Laserlab-Europe, together with Luis Silva, the President of the School Council of IST, welcomed the attendees and gave a short introduction to the Laserlab-Europe project and the position of IST in the science landscape in Portugal.

### **Session 1**

The coordinator and local host handed over to Marius Horch (FU Berlin), the chair of the session on Lasers for Catalysis. The session presented four talks:

- Photocatalytic hydrogen generation and CO<sub>2</sub> reduction using inorganic and organic photosensitisers. Using time resolved spectroscopy to aid in identifying the intermediates in the photocatalytic processes, Mary Pryce (Dublin City University)
- Light-induced catalysis using plasmonic metal nanoparticles, Sven Askes (Vrije Universiteit Amsterdam)
- Catalysis in the light of lasers, Johan Zetterberg (Lund Laser Center)
- Unveiling key intermediates in organocatalyzed reactions by IR ion spectroscopy, Davide Corinti (Sapienza Università di Roma)

### **Session 2**

The second session on the first day on Attoscience was chaired by Marc Vrakking (Max Born Institute) who introduced the talks and speakers:

- Capturing coherent electron dynamics in chiral molecules, Vincent Wanie (DESY)



- Controlling high order harmonic focusing properties: spatial shaping to reduce XUV chromatic aberrations, Eric Constant (Institut Lumière Matière)
- Attosecond soft X-ray spectroscopy for studying many-body dynamics in condensed matter systems, Themistoklis Sidiropoulos (ICFO, Max Born Institute)
- Control of high harmonic XUV source wavefront, Amelle Zair (King's College London)
- Towards a standard for laser pulse compressibility, Fabio Giambruno (Sphere Ultrafast Photonics)
- All-attosecond transient absorption spectroscopy using HHG, Bernd Schuette (Max Born Institute)

### **Public lecture of Nobel laureate Anne L'Huillier**

A special highlight was the public lecture of Anne L'Huillier (Lund University), 2024 Nobel laureate in Physics, in the afternoon of the first day. Following an introduction by John Collier (Central Laser Facility), she presented "The route to attosecond pulses", highlighting some of the key steps in the field of attosecond science.

### **Session 3**

On the second day, a session on Lasers in a multi-instrumental world was introduced by Daniela Stozno (Laserlab-Europe). The session consisted of the following presentations:

- ReMade@ARI: Tailor-made Access Routes for Advancing Materials Development for a Circular Economy, Barbara Schramm (HZDR)
- RIANA: Research Infrastructure Access in NAnoscience & nanotechnology, Michael E. Stuckelberger (DESY)
- Lasers4EU: A multi-faceted approach for demand-driven fundamental and applied research, Sylvie Jacquemot (LULI)
- Recent developments in the applications of X-ray Free Electron Lasers, Majed Chergui (EPFL, Elettra Sincrotrone Trieste)

### **Session 4**

Session 4 on Lasers for health was split into two parts, the first one addressing Lasers for oncology was moderated by Dino Jaroszynski (University of Strathclyde) and included the following talks:

- Delineation of gastrointestinal tumour biopsies using a fibre-based autofluorescence lifetime imaging probe, Riccardo Cicchi (LENS)
- Laser-driven, very-high energy, electrons (VHEE): a versatile tool for radiation biology, Alessandro Flacco (LOA)
- Preliminary results of radiobiology experiments by laser driven ionizing radiation beams, Emília Rita Szabó (ELI ALPS)

The second part targeted Lasers for Imaging & Diagnosing Life, with an introduction by Luis Arnaut (Coimbra Laser Lab) and the following presentations:

- Photo(opto)-acoustic imaging and sensing in time and frequency domain for Life Sciences, Giannis Zacharakis (IESL-FORTH)
- Femtosecond pulses for Pathology, Frank van Mourik (Flash Pathology)
- Developing Photoactive Transition Metal Complexes Towards DNA Targeted Diagnostics and Therapeutics, Susan Quinn (University College Dublin)
- Optical Photothermal infrared imaging using free electron laser as pump source, Christoph Krafft (Leibniz IPHT)
- Immuno-OCT: Structural and molecular sensitive imaging in vivo at unprecedented resolution, Johannes F. de Boer (Vrije Universiteit Amsterdam)



## Session 5

The final session of the conference in the morning of the third day focused on Lasers and laser-based instruments for the future. Sébastien Le Pape (LULI) introduced the following talks:

- Laser Drivers for Inertial Confinement Fusion, Mariastefania De Vido (Central Laser Facility)
- Manipulation of laser-based secondary sources for enhanced EUV and x-rays, Marta Fajardo (Instituto Superior Técnico)

At the end of the Conference, the local host IST organised lab tours for the participants.

The presentations are made available to the participants on the Laserlab-Europe cloud. Details and a book of abstracts are available at

<https://www.laserlab-europe.eu/events/laserlab-events/2024/laserlab-europe-conference>

## 3.2 Industrial participation

As part of the conference, exhibition space was provided for companies that could set up stands showcasing their innovations. Several regional industrial representatives from Portugal and Spain, as well as companies from France, Poland and the Czech Republic, presented their companies and latest developments and participated in the conference.

The option to contribute to the programme with a company's perspective was appreciated and the following talks from industrial representatives were given:

- Session on Attoscience: Towards a standard for laser pulse compressibility, Fabio Giambruno (Sphere Ultrafast Photonics, PT)
- Session on Lasers for imaging and diagnosing life: Femtosecond pulses for Pathology, Frank van Mourik (Flash Pathology, NL)

In addition, company representatives attended the sessions and participated in the discussions.

The following companies participated in the exhibition:

- Amplitude (FR)
- CRYTUR (CZ)
- Fluence Technology (PL)
- FYLA (ES)
- iLOF (PT)
- LaserLeap (PT)
- Lasing (ES)
- Sarspec (PT)
- Sphere Ultrafast Photonics (PT)

## 3.3 User meeting

All users of Laserlab-Europe's transnational access programme have been invited to attend the conference, and the topical sessions included talks from users that complemented the perspective of research infrastructure representatives.

In session 1 on "Lasers for catalysis" two users presented their research performed at Laserlab-Europe labs, namely Mary Pryce and Davide Corinti. Session 2 on "Attoscience" included talks by the users Eric Constant and Amelle Zair. In session 3 on "Lasers in a multi-instrumental world", Majed Chergui presented his research combining lasers and FELs, and in



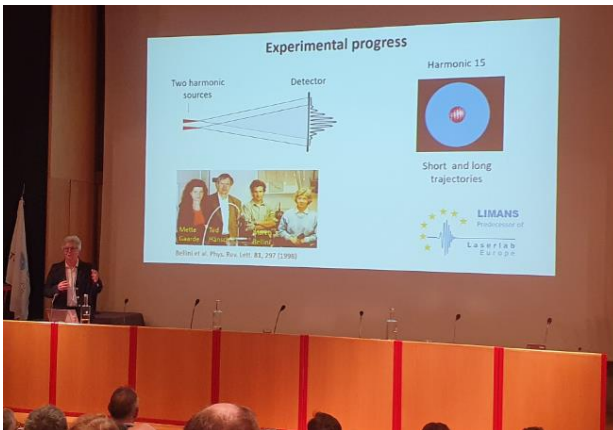
sessions 4a on “Lasers for oncology” as well as 4b on “Lasers for imaging and diagnosing life”, respectively, Emilia Rita Szabo and Susan Quinn gave talks on their experiments at Laserlab-Europe labs.

Given the broad range of scientific areas covered by the Laserlab-Europe access programme, the chosen format of the conference with dedicated topical sessions provided for very lively exchange with the users on their research results.

#### 4 Conclusions and outlook

The conference has been a highly appreciated opportunity for the laser community to meet and exchange about ongoing research and latest results in various topics. The participants benefited from the lively discussions to exchange about needs and research routes for the future.

Feedback from the industrial participants has been very positive, and all participants expressed a strong wish for follow-up conferences.



Conference impressions

