

Laserlab-Europe AISBL Annual Report 2024

www.laserlab-europe.eu



At a glance

Laserlab-Europe AISBL is an international not-for-profit association, bringing together 47 leading laser research infrastructures in 22 European countries.

Our mission is to promote the cooperation between European-level laser research infrastructures (RI) and to coordinate their operation with the objectives of bringing together 47 leading laser research infrastructures (RIs)

- facilitating the development of advanced lasers and laser-based technologies for research and innovation,
- stimulating and promoting the efficient utilisation of existing advanced laser by Users from academia as well as industry and medical centres, thus exploiting their full scientific and technological potential,
- promoting scientific excellence in laser-based research, by allowing experiments of the highest scientific quality to utilise the most suitable laser RI, independently of the affiliation of the Users and of the location of the RI, and
- stimulating and reinforcing cost efficient development of European laser RIs, by coordinated R&D efforts, staff exchange and sharing of know-how



47

MEMBER
INSTITUTIONS

22

MEMBER
COUNTRIES

2.900

TOTAL NO. OF ALL
FACILITY USERS
PER YEAR

32%

TRANSNATIONAL
ACCESS USERS PER
YEAR
(% of total facility users,
worldwide, non national)

250

AVERAGE NUMBER
OF PUBLICATIONS
BY USERS

Welcome



It is my great pleasure to present the 2024 Annual Report of Laserlab-Europe AISBL.

In 2024, we launched three new projects that further our mission to support European research excellence. After the successful completion of Laserlab-Europe V, we celebrated the kick-off of its successor, the Lasers4EU project, in Heraklion, Greece. This event set the stage for four years of impactful collaboration and continued access opportunities for external scientists who will have access to an even broader range of laboratories. Secondly, the RIANA project, a collaboration across multiple research infrastructure networks, is providing vital resources in nanoscience and nanotechnology, including access to advanced laser techniques. With a complementary focus, the 360 CARLA initiative is promoting careers in photonics by offering training, mentorship, and career development opportunities to early-career professionals.

Another key highlight of the year was the Laserlab-Europe Conference in Lisbon from 27-29 May, bringing together researchers from across Europe and also from the US to discuss the latest advancements in laser science. With distinguished speakers such as Nobel laureate Anne L'Huillier, and an engaging exhibition showcasing cutting-edge technologies, the conference was a remarkable success in fostering collaboration and innovation.

This year also saw the election of a new Management Board, and the strengthening of our expert groups, which play a crucial role in coordinating research efforts and promoting knowledge exchange among our member institutions.

As we move forward, we remain committed to driving innovation, strengthening collaborations, and supporting researchers across academia and industry.

JOHN COLLIER

Executive Director
Laserlab-Europe AISBL

Expert Groups

Laserlab-Europe AISBL pursues the goal to actively coordinate the development of advanced lasers and laser-based technologies, and to promote the efficient utilisation of advanced laser facilities by users from academia and industry to the benefit of European

science and society. Expert groups for topics of common interest boost collective action and strengthen the quality and impact of the research carried out at each facility.

laserlab-europe.eu/expert-groups/

Expert groups have been established on the following topics



DATA ANALYSIS IN IMAGING AND SPECTROSCOPY



LASERS FOR CLEAN ENERGY



LASER SCIENCE FOR HEALTH



MICRO- AND NANO-STRUCTURED MATERIALS FOR EXPERIMENTS WITH HIGH-POWER LASERS



LASER-DRIVEN ICF/IFE



PHOTOACOUSTICS



LASER-GENERATED ELECTROMAGNETIC PULSES

WORKSHOP ON MICRO- AND NANO-STRUCTURED MATERIALS FOR EXPERIMENTS WITH HIGH-POWER LASERS IN LISBON

On 21 September 2024, the Laserlab-Europe Expert Group “Micro- and Nano-Structured Materials for Experiments with High-Power Lasers” gathered in Lisbon, Portugal.

The workshop was a great opportunity to discuss about new technologies and new experimental schemes with high-power lasers. Topics ranged from charged particles acceleration, to inertial confinement fusion, to materials engineering and manufacturing. Interesting and lively discussions started after each oral presentation.

During the general discussion session at the end of the workshop, it was widely suggested to organise a new edition of the workshop in a year's time, to provide an opportunity to bring together theoretical



studies, experiments and manufacturing technologies in the same place. This future edition will provide a general view on the status of the research on micro- and nano-structured materials, and will generate important and wide-ranging discussions to foster new collaborations and connections.

The workshop, involving the members of the Laserlab-Europe expert group and the wider community, was organised as satellite meeting of the 37th European Conference on Laser Interaction with Matter (ECLIM).



New projects in 2024

Laserlab-Europe AISBL fosters collaboration and is actively involved in several European projects that drive scientific progress and technological development. In 2024, Laserlab-Europe AISBL participated in nine projects, each contributing to advancements in laser science and technologies. By facilitating knowledge exchange and providing world-class research opportunities, Laserlab-Europe AISBL continues to strengthen Europe's position at the forefront of laser research.

laserlab-europe.eu/about/projects/

360 CARLA



The 360 CARLA project is a comprehensive career development initiative aimed at shaping the future of photonics professionals. It highlights the various career launch paths in the field of photonics, which involve training, mentorships, experiences and symposiums. The project brings together a consortium of 12 partners, including several members of Laserlab-Europe AISBL, among them ICFO (coordinator of the project), MBI, CUSBO/POLIMI and ILC SCSTI. 360 CARLA is funded by the European Union Horizon Europe research and innovation program.

<https://carlahub.eu/>

Lasers4EU



Lasers4EU is incorporating the major laser research infrastructures into a comprehensive virtual distributed laser research infrastructure that is offering to a broad user community access to an exceptional portfolio of technical and scientific capabilities. Lasers4EU users can conduct research in a variety of fields, from deepening fundamental knowledge – in chemistry, life science, physics, materials science and laboratory astrophysics/chemistry – to exploring societal applications – for health, energy, cultural heritage, food and environment – through developing innovative laser-based tools and technologies. 27 members of the Laserlab-Europe AISBL provide transnational access to international users coming from academia and industry.

<http://www.lasers4.eu>

RIANA



RIANA encompasses 69 Research Infrastructures covering the most advanced techniques in nanoscience and nanotechnology relevant for synthesis, nanofabrication, processing, characterisation, analytics, as well as simulation capacity. It is a joint project of the ARIE networks LEAPS, e-DREAM, RADIATE, LENS, EuroNanoLab, EUSMI, and Laserlab-Europe. Transnational access is offered to international researchers from science and industry.

The following Laserlab-Europe infrastructures offer access to laser-related techniques:

CALT, CELIA, CLF, CLL, CLPU, CLUR, CUSBO, FELIX, FERMI, HiLASE, INFLPR, LENS, LIDYL, LLC, LP3, MUT, and ULF-FORTH.

riana-project.eu/

2024 highlights



Laserlab-Europe AISBL elects new Management Board

The General Assembly of Laserlab-Europe AISBL has elected a new Management Board in May 2024. The members are:

- John Collier (CLF; Executive Director)
- Freek Ariese (LaserLab Amsterdam; Chair of the General Assembly)
- Vincent Bagnoud (GSI)
- Giulio Cerullo (CUSBO)
- Fabrizio Consoli (ENEA)
- Sylvie Jacquemot (LULI)
- Stéphane Petit (CELIA)
- Rosa Weigand (Complutense University Madrid, User Representative)

The Management Board is the executive body of the association. It is responsible for managing and representing the Association and for implementing the general directions and policies decided by the General Assembly. The Management Board consists of eight members elected by the General Assembly for a term of three years.

Laserlab-Europe Newsletter #37: Cultural Heritage



From decoding ancient secrets to preserving iconic masterpieces, laser-based technologies continue to transform our understanding of cultural heritage. The laser experts from Laserlab-Europe play an important role in uncovering, understanding, and preserving Europe’s rich history. In this issue of the newsletter, we highlight remarkable projects that demonstrate the unique power of laser technologies to examine and preserve Europe’s cultural treasures for generations to come.



Successful Laserlab-Europe Conference in Lisbon

The Laserlab-Europe Conference on the latest advances in laser technology and laser science took place in Lisbon from May 27-29, 2024, bringing together researchers from Europe and the US. Hosted by Laserlab-Europe at Instituto Superior Técnico, Lisbon, this conference served as a platform to display results and access highlights from the Laserlab-Europe project, and foster collaboration within the laser community and beyond.

Spanning three days, the conference offered a comprehensive programme from sessions exploring the applications of lasers to discussions on cutting-edge attoscience. Distinguished speakers, including Nobel laureate Anne L’Huillier from Lund University, shared their expertise and fascinating insights into their current work.

In addition to stimulating sessions, an exhibition, showcasing cutting-edge solutions from nine innovative companies, was a highlight during the breaks. It provided a unique opportunity for attendees to explore the latest technologies and discuss potential future collaborations.

Laserlab-Europe Newsletter #36: Attoscience



Attoscience empowers the observation and control of phenomena occurring within infinitesimal timeframes. In celebration of the remarkable achievements by the recent Nobel laureates in Physics, this issue of Laserlab Forum is dedicated to the captivating realm of attoscience. Presented within are a series of articles spotlighting ongoing investigations carried out within our consortium.

A look back on the Laserlab-Europe V highlights

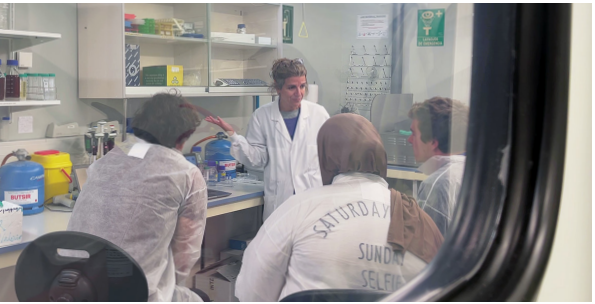
The EU-funded project Laserlab-Europe V concluded its five-year collaboration in November 2024, transitioning seamlessly into the new Lasers4EU project. For a look back on the highlights over the project period, visit

laserlab-europe.eu/a-look-back-on-lle5

Lasers4EU kick-off meeting held in Heraklion, Greece

The Lasers4EU project held its kick-off meeting in Heraklion, Greece, on 21-22 October 2024, marking the official start of the EU co-funded initiative. The two-day event brought together project partners from across Europe to discuss the goals for the next four years.

The meeting began with welcoming remarks from Costas Fotakis, Distinguished Member of the Foundation Organization for Research and Technology (FORTH), and an overview of the project’s objectives by Sylvie Jacquemot, the scientific coordinator. The first day included the election of project boards and a visit to advanced laboratories at IESL-FORTH, followed by a traditional Greek dinner for networking. On the second day, work package leaders presented their plans, and interactive sessions clarified collaboration needs. The meeting concluded with a guided tour of the Heraklion Archaeological Museum.



Training Schools 2024

27-31 MAY	Laserlab-Europe Training Course on Intense Lasers, Talence (Bordeaux), France
24-26 JULY	Summer School on Hands-on Design of Metasurfaces for Ultrafast Lasers, Graz, Austria
19-23 AUGUST	Summer School: Advanced Experimental Training in Laser Physics and Ultrashort Pulse Characterization, Vilnius, Lithuania
9 OCTOBER	Training event on laser-induced printing for microscale additive fabrication, Marseille, France
9-11 OCTOBER	Training school on advanced data processing methods, Castelldefels/Barcelona, Spain
13 NOVEMBER	Training event on laser-induced printing for microscale additive fabrication, Marseille, France
12-15 NOVEMBER	Hands-on Course on MINDLAB: Manipulating and Investigating Neural Dynamics for Learning and Ageing in the Brain, Castelldefels/Barcelona, Spain





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