

# Laserlab-Europe AISBL Annual Report 2023

[www.laserlab-europe.eu](http://www.laserlab-europe.eu)





## Access to our laser laboratories

ACTUAL / ESTIMATED NO. OF STAFF INVOLVED IN PROVIDING ACCESS	~5700 person months per year, i.e. ~475 FTEs
ANNUAL OPERATING COSTS	€73,844,400.00
ANNUAL SUPPORT BY EC	€787,030.00
TOTAL NO. OF ALL FACILITY USERS PER YEAR	2900
TRANSNATIONAL ACCESS USERS PER YEAR	24 % (European, non national)
INDUSTRY USERS PER YEAR	3 % (industrial & medical centers)
EU-WIDENING STATE USERS PER YEAR	13 %
NON-EU USERS PER YEAR	8 %
AVERAGE NUMBER OF PUBLICATIONS USERS PER YEAR	250 (2020-2023)

# Welcome



It is my pleasure to present the first public annual report of Laserlab-Europe AISBL. 2023 has been a landmark year for us, filled with numerous achievements and advances in the field of laser science and technology.

In October, our community celebrated that Anne L’Huillier, Pierre Agostini, and Ferenc Krausz, all engaged with Laserlab-Europe labs, now or in the past, were honored with the prestigious Nobel Prize in Physics. Their ground-breaking contributions have paved the way for revolutionary advances in laser science.

Further highlights of our network were the launch of three new European Union funded projects – THRILL, fastMOT and nanoSCAN – in the AISBL portfolio, alongside the approval of our Lasers4EU proposal. Starting on the 1st of October 2024, Lasers4EU will ensure that users can apply for transnational access to our laser laboratories in a large variety of scientific topics during the next five years. Additionally, we published a European Laser Science and Technology Landscape Analysis in collaboration with ELI ERIC, providing crucial insights into the current state and future prospects of research infrastructures in our field. By welcoming ILIL as a new member to our growing community, we are reinforcing our commitment to fostering collaboration and innovation.

As we reflect on these accomplishments, we look forward to continuing our mission to advance laser science and technology in Europe and beyond.

JOHN COLLIER  
Executive Director  
Laserlab-Europe AISBL

# 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 the operation of laser RIs with the objectives of

- facilitating the development of advanced lasers and laser-based technologies for research and innovation,
- stimulating and promoting the efficient utilisation of existing advanced laser RIs 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 and by fostering uniqueness and avoiding expensive duplications.

**47 members**  
**22 countries**

## New Member

ILIL – The Intense Laser Irradiation Laboratory

ILIL was established in 2000 and is operated at the Pisa site of the CNR-National Institute of Optics (CNR-INO) in Italy. The ILIL Laboratory offers expertise and instrumental capabilities based on high- and ultrahigh-power, ultrashort pulse lasers and fully equipped experimental areas for the study of plasma physics, and the development of technologies that find applications in the life sciences and energy sectors.

<https://ilil.ino.cnr.it/>





# 2023 highlights

## NOBEL PRIZE

### Anne L'Huillier, Pierre Agostini and Ferenc Krausz receive the 2023 Physics Nobel Prize

The Nobel Prize in Physics 2023 was awarded to Anne L'Huillier (LLC, Sweden), Pierre Agostini (Ohio State University, USA) and Ferenc Krausz (MPQ, Germany) for experimental methods that generate attosecond pulses of light for the study of electron dynamics in matter.

The three Nobel Laureates in Physics 2023 are being recognised for their experiments, which have given humanity new tools for exploring the world of electrons inside atoms and molecules. The laureates' experiments have produced pulses of light so short that they are measured in attoseconds, thus demonstrating that these pulses can be used to provide images of processes inside atoms and molecules.

Laserlab-Europe is very proud of the accomplishments of the laureates all of which have a long history of collaboration within Laserlab-Europe.

## NEW DIRECTOR

### Laserlab-Europe AISBL elects John Collier as new Executive Director

In August, the General Assembly of Laserlab-Europe AISBL has elected John Collier, Director of the Central Laser Facility (CLF), an institution of the Science and Technology Facilities Council, UK, as its new Executive Director.

John Collier succeeds Jens Biegert of ICFO - The Institute of Photonic Sciences in Barcelona, Spain, who has served as Executive Director since 2021. Prior to assuming the role of Executive Director, Collier has been the Vice-Chair of the General Assembly of Laserlab-Europe AISBL since March 2022 and has been actively involved in the association for many years. Besides his work for Laserlab-Europe, he has led the CLF for over a decade, building it into one of the world's leading research centres using lasers, and establishing the CLF at the heart of major international programmes.

## LANDSCAPE

### European Laser Science and Technology Landscape Analysis published

Laserlab-Europe and the Extreme Light Infrastructure (ELI ERIC) have joined forces to analyse the current laser-based science landscape in Europe. The analysis, funded by the EC and published in October 2023, aims to assess the European laser community to provide a better understanding of the services offered to users by Research Infrastructures (RIs) operating laser sources as well as the user needs and requirements. The consolidated report gives an overview of the complex landscape of laser RIs in Europe, identifies complementarities and efforts to be aligned, and defines high-level objectives. The factual and up-to-date information provided will support discussions – with the European Commission and with national agencies – about sustainable funding for RIs. It will prove valuable insight to decision-makers, stakeholders and the wider laser RI community in ensuring the growth and sustainability of this critical field.

## LASERLAB-EUROPE MEETING IN RIGA

### Foresight Workshop on Future Laser-Based Technologies and General Assembly in Riga

From 24-25 July 2023, the Laserlab-Europe community gathered in Riga, Latvia, for an EC-funded Foresight Workshop to discuss promising technologies shaping the future of the laser cosmos. Sessions on environment & water, photoacoustics, and laser processing for materials structuring with diverse interesting presentations led to a lot of productive discussions and exchange on ideas for new projects. On the following day, the member representatives of the Laserlab-Europe association met for its General Assembly.

# Ongoing projects

## Laserlab-Europe V



The EU-funded project Laserlab-Europe brings together 35 leading institutions in laser-based interdisciplinary research from 18 countries. Together with associate partners, the consortium covers the majority of European member states. 24 laboratories offer transnational access to their facilities for research teams from Europe and beyond, kindly supported by EC funding. Access is provided to a large variety of inter-disciplinary research, including life sciences, free of charge.

[www.laserlab-europe.eu](http://www.laserlab-europe.eu)

## EURIZON



The EU-funded project EURIZON targets scientific and technical collaboration to develop and deliver new cutting-edge technologies for European research infrastructures (RIs) and for RI upgrade projects currently underway, such as 4th-generation synchrotron projects and instrumentation at modern neutron sources. It includes in addition a special focus on coordination and support measures dedicated to support Ukrainian scientists and Ukrainian RIs.

<http://www.eurizon-project.eu>

## ReMade@ARI



ReMade@ARI offers access to European labs for developing innovative, sustainable materials for a circular economy. The EC-funded project involves analytical facilities, instrumentation, methods and the know-how to use them for advanced materials characterisation. It provides scientists who are working on the design of new recyclable materials with analytical tools that enable them to explore the properties and the structure of their material in smallest details up to atomic resolution. Transnational access opportunities to various techniques, not only laser sciences, are provided by more than 45 access providing institutions.

[www.remade-project.eu](http://www.remade-project.eu)

# New projects in 2023

## THRILL



The INFRATECH project THRILL, developing "Technology for High-Repetition-rate Intense Laser Laboratories", provides new schemes and devices for pushing forward the limits of research infrastructures of European relevance and ESFRI landmarks. The consortium works on advancing technology in the field of high-energy high-repetition-rate lasers, but also to train a highly skilled workforce for tomorrow's challenges in research infrastructures and industry. The EU-funded project is coordinated by GSI. Further participants are HZDR, LULI, ELI, Amplitude, XFEL, FAIR, University of Rochester, and Laserlab-Europe AISBL.

[www.thrill-project.eu](http://www.thrill-project.eu)

## NanoSCAN



With its game-changing technology, the EU-funded nanoSCAN project will provide crucial 3D spatial biology imaging insights into cell and tissue function, improving the effectiveness of cancer immunotherapy by identifying the best therapy for a patient. The EIC Transition project NanoSCAN is led by the French CNRS-ISMO. Further partners are IFN-CNR, POLIMI, Abbelight, and Laserlab-Europe AISBL.

[www.nanoscan-project.eu](http://www.nanoscan-project.eu)

## fastMOT



The EIC Pathfinder project fastMOT develops an innovative light sensing solution, a fast gated, ultra-high quantum efficiency single-photon sensor, to enable multifunctional deep body imaging with diffuse optics. With its Multifunctional Optical Tomograph (MOT) the consortium will be able to image deep organ and optical structures and monitor body functions including oxygenation, haemodynamics, perfusion and metabolism. fastMOT is funded by the EU's Horizon Europe programme and by UK Research and Innovation (UKRI). The project is coordinated by the Dutch company Single Quantum, and participants are POLIMI, ICFO, TU Delft, University College London, and Laserlab-Europe AISBL.

[www.fastmot.eu](http://www.fastmot.eu)



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