



European Laser Research Infrastructures serving Science and Industry

Grant Agreement N° 101131771

WP 5

User training

D5.2

**Intermediate report on the “User training & professional staff
development” activities**

Lead Beneficiary: IDRYMA TECHNOLOGIAS KAI EREVNAS (FORTH)

Due date of deliverable: M24 – 30.09.2026

Type and dissemination level: Report, Public

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Disclaimer

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About Lasers4EU

Lasers4EU incorporates the major laser research infrastructures, in a large number of European member states, into a comprehensive virtual distributed laser research infrastructure that offers to a broad user community, from academia and industry, access to an exceptional portfolio of technical and scientific capabilities. This unique set of instruments together with the specific scientific expertise at the host facilities allows Lasers4EU users to carry out high-level research in an extremely wide range of high-impact topics in life sciences, materials nano-processing, etc.

Laser technology has experienced remarkable advances and breakthroughs in the last 60 years and is now a key innovation driver for highly diversified societal applications and products, thereby substantially contributing to economic growth and to solving challenges in the areas of health, environment and energy. Through its strategic approach, Lasers4EU aims to strengthen Europe's leading position and competitiveness. It facilitates long-term coordination of the laser research activities within the European Research Area and provides concerted and efficient services to scientific, industrial and medical researchers. The main objectives of Lasers4EU are to:

- provide coordinated access to high-quality services based on a coherent and comprehensive consortium of 27 leading European laser installations offering to users from academia and from industry cutting-edge performances at the forefront of the laser technologies,
- structure the European landscape of laser Research Infrastructure through enhanced access, extended geographical coverage, novel science diplomacy activities, improved synergies with other European networks and projects,
- increase European human resources in the field of laser science by implementing training activities towards researchers from new domains of science and technology and from geographical regions where laser communities are still less developed.

1 Introduction and objectives

A central mission of the Lasers4EU project is to foster the engagement and growth of future generations of laser users across Europe. This is pursued through the development and coordination of user training activities, alongside efforts to attract emerging user communities.

This mission translates into:

- I. The organisation of user training schools and the provision of openly accessible training materials, such as recorded lectures, slides and tutorials, derived from the Lasers4EU training schools and made available through the project website. These materials support the education and upskilling of young researchers and technical staff, thereby enhancing scientific excellence in laser-based applications.
- II. The development of the pre-project training scheme, intended for team members, preferably early-career researchers, who visit the access-providing infrastructure shortly before an access project begins to receive training on its equipment and thereby improve the efficiency of the subsequent experiments.
- III. The preparation of a pilot online software tool package aimed at supporting users from disciplines outside Lasers4EU's core fields (e.g., biology, medicine, the arts). This tool will help them understand laser radiation and laser-target interactions, enabling them to better design and interpret their experiments.

To measure the success and impact of these initiatives, Lasers4EU has defined the following key performance indicators (KPIs):

- Organisation of at least one user training school per year;
- Participation of one quarter of users in the pre-project training scheme;
- Development and deployment of a pilot software package focused on laser-matter interaction for laser processing to support the design and analysis of experiments.

2 Task 5.1: User training schools

This section reports on the implementation of Task 5.1 over the period M1–M24 (1 October 2024 – 30 September 2026): the completion of the events funded through the 2025 internal call, the outcome of the 2026 internal call, and the first assessment of participation, results and impact.

2.1 Annual calls for training events

The first internal call was launched on 12 December 2024. Four proposals were received, of which three were approved by the Activity Board (Leibniz IPHT, HiLASE Centre and ICFO), while the fourth proposal (CNRS-LP3) was rejected. All three approved events have since been delivered, the last of them in November 2025.

The second internal call was published on 27 November 2025 and was open to consortium members and to partners affiliated with Laserlab-Europe AISBL and ELI ERIC. Events had to be held during 2026, on-site or online, with a duration of two to three days; co-organisation with industrial partners was strongly encouraged, and already planned events were eligible for co-funding, provided that they included a clearly defined training component and were well aligned with the consortium’s research areas. Two proposals were received from the Max Born Institute and from ICFO; both were positively evaluated by the Activity Board and both events have been delivered. The selection process and Board composition remain as described in *Deliverable 5.1 Training concept and first events* and all events were announced on the project website ([Training events | Lasers4EU](#)).

Table 1 - Lasers4EU training events funded and delivered during the reporting period

Training event	Organiser	Call	Dates	Venue format	Status
International Career Workshop “Women in Photonics”	Leibniz IPHT	2025	1–5 June 2025	Jena, DE – on-site	Completed
Hands-On Training on High-Power Lasers for Industrial Applications	HiLASE Centre	2025	16–17 Oct. 2025	Dolní Břežany, CZ – on-site	Completed
Hands-on Course on MINDLAB - 2 nd edition	ICFO	2025	4–7 Nov. 2025	Castelldefels, ES – on-site	Completed
Online Training on Experimental Methods and Data Analysis for Femtosecond and Attosecond Spectroscopies	MBI	2026	9–11 June 2026	Online	Completed
Hands-on Course on MINDLAB – 3rd edition	ICFO	2026	13–17 July 2026	Castelldefels, ES – on-site	Completed

2.2 Training events delivered

2.2.1 International Career Workshop “Women in Photonics” (Leibniz IPHT, Jena, 1–5 June 2025)

The fifth edition of the *Women in Photonics international career workshop* was held at the Leibniz Institute of Photonic Technology in Jena from 1 to 5 June 2025 and was co-funded by Lasers4EU. The series targets female PhD students and postdoctoral researchers working in optical health technologies, biomedical microscopy, biophotonics, laser-based technology, photonic data science, optical engineering and fibre optics, with the 2025 edition placing particular emphasis on health applications. Registration was free of charge. Applicants submitted a CV and an abstract, which were reviewed as part of the selection process, with preference given to candidates who had not attended a previous edition. Of 133 applications, 49 participants from 16 countries were selected to attend, 40 of whom received a travel grant.

The event combined high-level scientific exchange with professional and career development. The scientific programme included participant talks, a poster session and four keynote lectures delivered by senior scientists from academia and industry, representing Humboldt-Universität zu Berlin, Coherent Corp., MPQ and CHASE GmbH. Scientific contributions covered topics ranging from SHG/THG and coherent Raman microscopy for medical diagnostics to fibre optics, photonic data science and ultrafast time-resolved spectroscopy of biological systems.

Alongside the scientific programme, participants took part in interactive career workshops and role-model sessions and had opportunities to engage directly with representatives from research and industry through an on-site exhibition involving ams OSRAM, Fraunhofer IOF, ZEISS, Jenoptik and Leibniz IPHT. The workshop concluded on 5 June with a practical laboratory session in which participants worked in small groups on advanced laser-based instrumentation at Leibniz IPHT.

The workshop supported both scientific exchange and career development by giving participants the opportunity to present their research to an international audience, strengthen their professional networks and establish contacts with peers, senior researchers and representatives from industry.

2.2.2 Hands-On Training on High-Power Lasers for Industrial Applications (HiLASE Centre, Dolní Břežany, 16–17 October 2025)

The hands-on training was held at the HiLASE Centre and was co-organised with Lasers4EU and Laserlab-Europe. Delivered by HiLASE experts, the training introduced participants to high-power

laser technologies and their industrial applications, combining theoretical instruction with practical laboratory experience.

The training was limited to 12 participants due to the capacity of the laboratories. Applicants submitted information on their academic and professional background and their motivation for participating. Applications were independently scored by the members of the selection committee, and invitations were issued according to the aggregated ranking. In total, 25 applications were received: 19 from male and six from female applicants, comprising nine postdoctoral researchers, eight PhD students, four master's students, three technical staff members and one undergraduate student. Nine participants from five countries ultimately attended the training.

The scientific and technical programme covered thin-disk and cryogenically cooled multi-slab diode-pumped laser technologies, as well as the principles and applications of Laser Shock Peening (LSP), Laser-Induced Damage Threshold (LIDT) testing and Laser Micromachining (LMM). Participants were also introduced to the associated characterisation techniques and instrumentation, including confocal microscopy, scanning electron microscopy (SEM), atomic force microscopy (AFM), Raman spectroscopy and X-ray diffraction.

The practical component included a mandatory briefing on laser safety and risk assessment, a guided tour of the HiLASE facility and hands-on workstation rotations at the LIDT, LSP and LMM laboratories. According to participant feedback, the training increased their ability to plan and conduct comparable experiments independently. Several participants subsequently took up internships or became involved in ongoing research activities at HiLASE, indicating a direct follow-up beyond the training itself.

2.2.3 Hands-on Course on MINDLAB (ICFO, Castelldefels, 4–7 November 2025)

The MINDLAB Hands-On Course introduced participants to advanced photonics-based technologies for investigating brain function across molecular, cellular and systems scales. Organised at ICFO in collaboration with Lasers4EU and Horizon Europe Project 360CARLA, the four-day programme combined lectures, hands-on laboratory sessions, group projects and interdisciplinary exchange, with a strong focus on the application of photonics to neuroscience and biomedical research.

Participation was open to master's students, advanced undergraduate students, PhD candidates and early-career postdoctoral researchers. Attendance was free of charge, and applicants were selected on the basis of their CV and a statement of purpose. The school brought together 18 participants, evenly divided between women and men.

The course opened in conjunction with the fourth Annual Meeting of the Barcelona Medical Photonics Network, providing participants with direct exposure to clinicians, technology developers and innovation professionals and linking the scientific training to current challenges and technological developments in healthcare. The subsequent programme combined lectures by researchers from ICFO and international institutions, including the University of Barcelona, the University of Pisa, UCL and Harvard Medical School, with practical rotations across five ICFO laboratories. These covered Super-resolution Light Microscopy and Nanoscopy, Neurophotonics and Mechanical Systems Biology, Medical Optics, Photon Harvesting in Plants and Biomolecules, and Single Molecule Biophotonics.

Through direct work with advanced instrumentation, participants were able to translate theoretical concepts into practical experimental experience. Group projects, discussions and networking activities further promoted exchange across disciplines ranging from physics and engineering to biology and neuroscience. The course therefore contributed to the Lasers4EU objective of broadening its user community by engaging young researchers from neuroscience, biomedical optics and related interdisciplinary fields and introducing them to advanced photonics technologies and research-infrastructure capabilities.

2.2.4 Online Training on Experimental Methods and Data Analysis for Femtosecond and Attosecond Spectroscopies (MBI, online, 9–11 June 2026)

The open call, published on the project website and on LinkedIn, attracted 84 applicants from 29 countries. The event adopted a two-tier online format: lectures and a virtual laboratory tour were open to all applicants, while four guided 90-minute hands-on data analysis sessions were limited to 30 selected participants from 16 countries. Selection for these sessions was based on research relevance and motivation, while also taking geographic and institutional diversity into account. Selected participants received the required software and datasets in advance, whereas all applicants had access to the lectures and virtual tour.

The scientific programme comprised lectures by ten speakers covering XUV pulse generation, CEP-stable lasers and HHG beamlines, transient absorption spectroscopy and its attosecond counterpart, time-resolved photoelectron and photoion spectroscopy, pulse characterisation techniques including FROG, d-scan, SPIDER, RABBIT and attosecond streaking, as well as laser safety. The virtual laboratory tour introduced participants to the MBI Ti amplifier and three experimental endstations.

The remote format also supported broader participation, particularly for applicants from countries

without local access to ultrafast laser facilities, who identified the online format as an important factor enabling their participation. In addition, a substantial share of participants attended a dedicated session on how to apply for Lasers4EU transnational access and prepare a proposal, thereby creating a direct link between the training activities under Task 5.1 and the access activities of WP3.

2.2.5 Hands-on Course on MINDLAB, third edition (ICFO, Castelldefels, 13–17 July 2026)

Funded through the 2026 call, this edition of the MINDLAB School was the third in the series and the second supported by Lasers4EU, confirming the course as a recurring element of the project's training programme.

Applicants were selected according to standardised criteria, with academic transcripts accounting for 40% of the overall score, the CV assessed on a scale of up to five points, and the motivation letter on a scale of up to three points. Laboratory allocation was subsequently based on the preferences indicated by participants during registration. The course brought together 27 participants from 12 countries, comprising 12 women and 15 men. Four participants came from middle-income countries, Mexico, Colombia, Costa Rica and Turkey. The cohort consisted mainly of bachelor's students (11) and master's students (8), alongside four PhD students, two postdoctoral researchers and two participants classified under other study or professional statuses. Most participants had a background in physics (18), complemented by participants from biology, engineering and mathematics.

The five-day course was scheduled to coincide with the ICFO Summer Fellows programme and followed a two-part structure. The first two days featured introductory lectures by ICFO faculty together with keynote presentations by invited external researchers. During the remaining three days, participants worked in five groups on laboratory-based projects hosted in different ICFO research laboratories. The projects addressed topics including pump–probe characterisation of the photocycle of optogenetic photoreceptors, confocal and STED super-resolution imaging of intracellular organelles, optogenetic and bioluminescence-based neuromodulation in *C. elegans*, light-sheet imaging of neuronal activity in zebrafish, and transcranial diffuse optics. The course concluded with presentations of the group projects to ICFO faculty and invited experts.

Participant feedback was highly positive, with respondents particularly valuing the direct mentorship provided by PhD students and postdoctoral researchers and the opportunity to work with instrumentation not normally accessible during university training. The most frequent suggestion for improvement was to increase the amount of laboratory time.

The course also included a session with the ICFO Talent Attraction unit, which introduced participants to further study and career opportunities at ICFO. In addition, up to two SPIE@ICFO Chair research internships of up to twelve months are offered on a competitive basis to outstanding course participants, providing a potential pathway for continued research engagement beyond the training itself.

2.3 Participation and assessment of the key performance indicator

The key performance indicator for Task 5.1 is the organisation of at least one user training school per year. One school was delivered in the first project year and four in the second, exceeding the midterm target of two events.

At least 287 applications were received and 133 researchers trained, in addition to participants attending the open online lectures of the MBI training. Application data for the first Lasers4EU-supported MINDLAB edition were not available and are therefore excluded from the total (Table 2). Participants' home institutions span Europe, Asia, the Middle East, Africa, the Americas and Oceania. As country-level data were not fully harmonised across all events, the figures should be regarded as conservative lower bounds, corresponding to at least 22 countries represented among participants and at least 35 among applicants.

Women represent the majority of the trained population, and participants range from advanced undergraduate students to postdoctoral researchers, in line with the focus on early-career scientists. All events included a practical component.

Table 2 - Participation statistics for Lasers4EU training events

Training event	Applications	Participants	Female participants	Countries represented	Duration (Practical share)
Women in Photonics (IPHT)	133	49	49	16	5 days (1 day)
High-Power Lasers (HiLASE)	25	9	2	5	2 days (1 day)
MINDLAB, 2nd ed. (ICFO)	n.a.	18	9	7	4 days (hands-on rotations)
Femto/attosecond spectroscopies (MBI)	84	30(+54 lectures)	13	16 (29 among applicants)	3 days (6 h hands-on)
MINDLAB, 3rd ed. (ICFO)	45	27	12	n.a	5 days (hands-on rotations)
Total	≥ 287	133 (+54)	85	≥ 22	19 days

2.4 Participant feedback and lessons learned

Anonymous surveys were conducted at the end of each event, with consistently positive feedback. Three main lessons emerge from the first half of the project. First, data analysis, rather than access to instrumentation, appears to be one of the main bottlenecks for early-career researchers, and training in this area generated demand exceeding the number of available places. Second, remote delivery proved to be an effective and low-cost means of broadening participation and should therefore be retained as a deliberate component of the training programme rather than treated as an exception. Third, the available dissemination data indicate different recruitment patterns: established event series attract participants largely through supervisors and personal recommendations, while social media proved particularly effective for newer online formats.

Participants also expressed interest in further training on laser construction and design, as well as on the simulation and modelling of laser systems. In both MINDLAB editions, participants additionally requested a stronger hands-on component. These needs and preferences will be considered in the preparation of future calls for training events.

2.5 Training materials and sustainability

All events were announced on the project website. The publication of training materials, foreseen as part of the sustainability measures outlined in Deliverable 5.1 and contributing to Task 2.2, progressed more slowly than planned due to the unavailability of some materials and the insufficient quality of certain recordings. Two presentations from the HiLASE training and six presentations from the MBI online training have now been published on the Lasers4EU training page. Materials from the remaining events are currently being collected and will be made available as soon as possible.

Follow-up opportunities for participants have also proved effective. Internships and ongoing research collaborations have been initiated at HiLASE, up to two SPIE@ICFO Chair research internships are available to MINDLAB participants, and several participants from the MBI cohort have expressed an interest in submitting transnational access proposals.

2.6 Outlook

A further online training, “Quantum Materials – from ARPES to trARPES”, organised by the Max Born Institute together with the Institute of Physics of the National Academy of Sciences of Ukraine and the Kyiv Academic University was held on 16 September 2026. Funded by the 360CARLA project and delivered in collaboration with Lasers4EU, the event attracted 300 applications from 51 countries and 173 online participants. It included a dedicated session on how to obtain funded

access to research infrastructures through the Lasers4EU transnational access programme, thereby extending the scope of Task 5.1 without impacting the work package budget. The level of interest in this aspect was notable, with 79 applicants explicitly indicating in the application form that they wished to learn more about Lasers4EU TNA.

The internal calls for training events in 2027 and 2028 will be prepared according to the timeline established at the start of the project, with the aim of maintaining at least one training school per year until the end of the project. Experience from the first half of the project, including the strong demand for online formats and for training linked directly to access opportunities, will guide the preparation of these calls. The collection and publication of training materials will also continue.

3 Task 5.2: Pre-project training scheme

As an innovative component of the Lasers4EU training concept, pre-project training is available to user groups who have been granted access to an access-providing facility. This scheme enables one team member, preferably an early-stage researcher, to visit the hosting facility prior to the main access period for experiment-specific training.

The training visit, lasting up to one week, aims to give the visiting researcher hands-on experience with the facility's equipment, experimental setups, data acquisition systems, and analysis methods. By strengthening technical preparedness, the training is intended to increase the efficiency and productivity of the subsequent experiments carried out by the full user group.

The main characteristics of the scheme are:

- **Eligibility:** One person per user group.
- **Timing:** Conducted immediately before the main access period; duration typically not exceeding one week.
- **Scope:** Training on facility equipment, procedures, safety, and data workflows.
- **Process:** The training request is submitted during the TNA proposal stage and must be confirmed by the facility during the feasibility check, prior to scientific evaluation.

The host facilities offer this training as an in-kind contribution, demonstrating their readiness to support users and enhancing their attractiveness as access providers within the Lasers4EU network.



LASERS4EU

OFFERS PRE-PROJECT TRAINING
TO YOUNG SCIENTISTS



➔ Apply for trans-
national access (TNA)
including pre-project
training

Arrange a visit to the host laboratory for up to one week
of hands-on training on the equipment, experimental set-ups,
and data-analysis methods you'll use.

➔ <https://lasers4.eu/training/pre-project-training>

The training request is submitted during the
access proposal stage and must be confirmed
by the facility during the feasibility check,
prior to scientific evaluation.

*The pre-project training at FORTH
was extremely valuable, espe-
cially as I had no previous experi-
ence working with laser systems.
It gave me a solid understanding
of the experimental setup,
safety procedures, and system
operation before my scheduled
experiments began, allowing me
to make the most of my allocated
experimental time and focus on
my research from day one. The
excellent supervision and readily
available support throughout the
visit made the entire experience
smooth, productive, and highly
rewarding.*

Shubhadeep Majumdar,
PhD student at ENPHOCAMAT

*The pre-project training offered by
Lasers4EU enabled me to discover
the COXINEL free electron laser
based on HZDR laser plasma
acceleration facility few days
before the beginning of a new
experimental campaign.*

*I was glad to meet the team
working at HZDR on the COXINEL
project and to learn from their
expertise on LPA.*

*I was taught how to remotely con-
trol the beamline elements related
to electron beam transport and
radiation characterization (essen-
tially magnets and diagnostics).*

*Thanks to this period, I learnt
enough about the beamline opera-
tion to efficiently join the following
experimental campaign dedicated
to space charge studies along the
free electron laser.*

Aliénor Rouxel,
PhD student at Soleil Synchrotron

Several pre-project training visits have been completed and others are ongoing. Detailed statistics on participation in the pre-project training scheme will be provided in Deliverable 3.1, the Intermediate Access Report.

The practical value of the scheme is illustrated in the dedicated flyer, which presents testimonials from researchers who have already benefited from pre-project training. Their experiences highlight how early familiarisation with the facility, instrumentation and experimental procedures can improve preparation for the subsequent access period and support a more efficient use of beamtime.

The scheme also provides early-career researchers with direct interaction and individual guidance from experienced facility staff, helping them gain confidence in working with specialised equipment and methods. At the same time, the preparatory visit allows potential technical, safety or data-workflow issues to be identified before the main experiment, benefiting both the visiting research team and the host facility.

Figure 1 - Pre-project training flyer

4 Task 5.3: Online software tools

4.1 Online pilot software

Users from disciplines outside the core research areas of Lasers4EU (biology, medicine or the arts, for example) often have limited knowledge of the laser-material interactions relevant to their samples. To address this need, FORTH has developed and deployed a pilot online software package, which remains under further development. The tool helps users familiarise themselves with laser radiation and the outcomes of laser–target interactions. The tool is designed to support users at three stages of the access process:

- I. **prior to access**, by predicting experimental observables and helping to identify a narrow window of radiation parameters for effective laser–material interaction;
- II. **on-site**, to allow adaptation of these parameters to real experimental conditions; and
- III. **post-access**, to support data analysis.

By supporting experimental preparation, optimisation and analysis, the tool is expected to contribute to more efficient use of access time and to enhance the dissemination and impact of access-related results.

The online software uses machine-learning approaches to simulate laser–material interactions and identify optimised laser parameters for both additive and subtractive laser-induced processing, including the fabrication of micro- and nanostructures on solid materials.

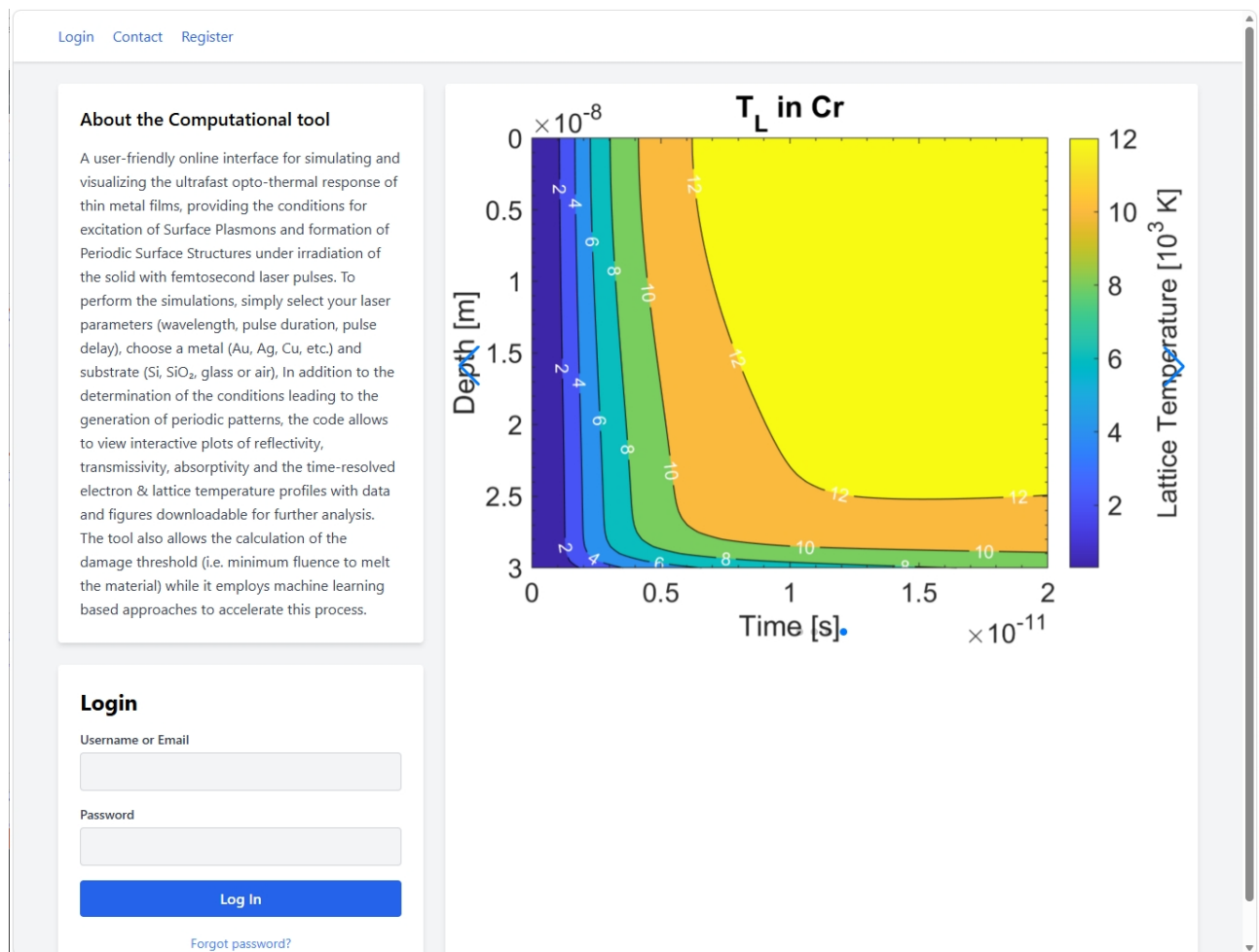
The pilot package currently includes the following functionalities:

- calculation of the thermal and optical response of commonly used materials, including Au, Cr, Cu, Ag, Al, Ni, Ti, Mo and stainless steel, on substrates such as SiO₂, Si, fused silica and air, under different laser conditions, with both graphical outputs and data available for post-processing;
- generation of maps identifying laser conditions associated with material damage and nano-/micro-structuring, again providing both graphical and numerical outputs;
- predictive modelling tools for identifying laser parameters associated with the onset of surface texturing; and
- a user-friendly Django-based interface allowing users to interact with the simulation parameters and results.

Lasers4EU partners may either adopt the tool and customise it through modular add-ons or use it as a basis for developing more specialised software packages as in-kind contributions to the work package.

The pilot software package is accessible at <https://plan-hub.iesl.forth.gr/>, where registered users can log in to the platform.

Figure 2 - Login interface with an example simulation output



4.1.1 About the computational tool

The tool provides an online interface for simulating and visualising the ultrafast opto-thermal response of thin metal films. It identifies the conditions under which surface plasmons are excited and periodic surface structures can form when a solid is irradiated with femtosecond laser pulses.

To run a simulation, users select the relevant laser parameters, including wavelength, pulse duration and pulse delay, as well as the metal (e.g. Au, Ag or Cu) and substrate (Si, SiO₂, glass or air). In

addition to identifying the conditions that lead to the formation of periodic patterns, the interface provides interactive plots of reflectivity, transmissivity and absorptivity, together with time-resolved electron and lattice temperature profiles. The corresponding data and figures can be downloaded for further analysis. The tool also calculates the damage threshold, i.e. the minimum fluence required to melt the material, using machine-learning methods to accelerate the computation.

After logging in, users access the software interface shown in Fig. 3, with options for Thermal Calculation, Prediction, Manual, Contact and Logout.

Figure 3 - Main menu of the online pilot software after login

[Thermal calc](#)
[Prediction](#)
[Manual](#)
[Contact](#)
[Logout](#)

Simulation Calculator

Material

Substrate

Thickness (nm)

Enter a value between 10 and 1000

Wavelength (nm)

Enter a value between 248 and 15000

Pulse Duration (fs)

Enter a value between 5 and 500000

Pulse Separation (fs)

Enter a value between 0 and 500000

Time-interval end (ps)

Max allowed end interval four times the recommended value

Run Simulation

The user enters the selected material properties and laser parameters, after which the program calculates and visualises several key quantities describing the material response to irradiation.

These include the temporal evolution of the electronic and lattice temperatures (Fig. 4), the temporal evolution of the surface reflectivity (Fig. 5), and a depth-versus-time map showing the evolution of the surface profile following laser irradiation (Fig. 6).

Figure 4 - Temporal evolution of the electronic (T_e) and lattice (T_l) temperatures following laser irradiation

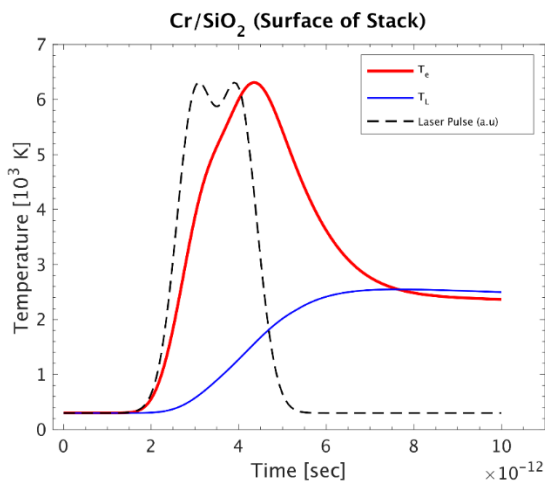


Figure 5 - Temporal evolution of the surface reflectivity following laser irradiation

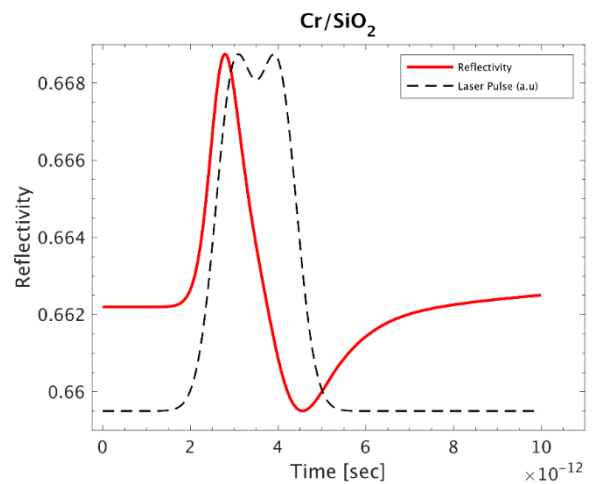
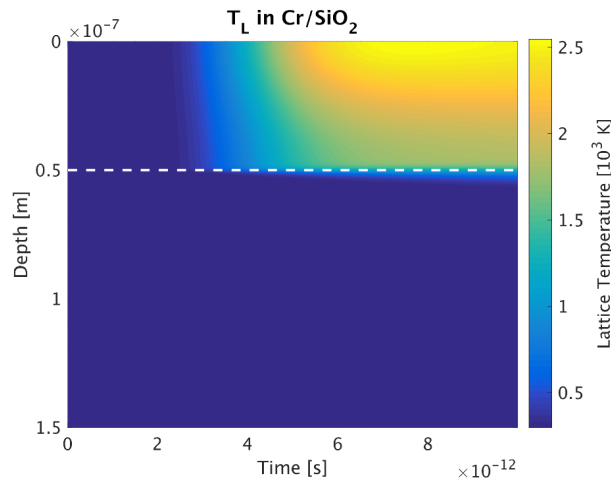


Figure 6 - Map of surface profile vs. time following laser irradiation of the surface



Further development of the pilot software may include:

- more efficient coupling of physics-based and predictive modelling;
- integration of physics-informed and data-driven models within the user-friendly interface;
- generation of fluence-versus-number-of-pulses maps for selected material and laser combinations;

- AI-assisted identification of the conditions required for the onset of nanostructuring;
- evaluation of the tool through feedback from partner facilities; and
- development of additional modular components contributed by Lasers4EU partners.

Users are invited to explore the software and its capabilities and to submit feedback and suggestions through the contact section of the interface.

4.2 Training videos

Short instructional videos represent a potentially useful additional means of informing and training users, particularly for demonstrating specific techniques, experimental procedures or data-analysis workflows used at Lasers4EU facilities. The development of such material is therefore being considered as a complementary training activity, subject to available resources and suitable contributions from partner facilities.

Where feasible, the material may include technical demonstrations, examples of data analysis and more general informational content for external users, students and staff. Making such resources available online would complement the existing training offer and facilitate access to training material irrespective of geographical location or disciplinary background.

Existing approaches at other research infrastructures provide useful examples of how video content can be used for training and outreach. DESY, for example, makes a range of films available to introduce its facilities, research areas and scientific activities. Similar short explanatory or instructional formats may serve as inspiration when considering suitable content and presentation formats for Lasers4EU.