

DOCUMENT 2

Strategic Plan

2017 - 2020

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1 Analysis of the Compliance with the Strategic Plan 2013-2016

Once concluded the period 2013-2016, established for the implementation of the previous strategic plan, we must indicate that despite the convulsive economic circumstances, most of the objectives set out have been fulfilled. CLPU renewed its participation in the national map of ICTS as a unique location facility, completed the installation of the VEGA laser system, and obtained the license as second-category radioactive facility from the Spanish Nuclear Safety Council (CSN) for the VEGA laser system. In addition, we also achieved excellent records in scientific production taking into account the Center is still in its construction phase.

The four-year plan of objectives was detailed in several annual plans that gradually integrated the objectives and strategies and established the indicators that measured the degree of compliance with them, which have been supervised by the Executive Commission.

On the other hand, the scientific strategy that converges in this strategic plan has been reviewed during this period by the CACT¹ with the following conclusions:

-  *"Laser and experimental installations have progressed significantly, many of them being fully operational already.*
-  *The level of readiness of the facility justifies the first "Call for Users" for VEGA-2.*
-  *We have observed a very cooperative atmosphere among the members of the leading scientific team of CLPU (director, CLPU Chair at the University of Salamanca, Head of Scientific Division). They show strong motivation and work effectively together with complementarity for the consolidation and excellence of the Center. Moreover, the relations between the Administration and the staff seem to be fluid and constructive.*
-  *The leading team is efficiently organizing the Center and starting to define coherent and ambitious scientific and technical objectives for the future, to be addressed with the equipment they are installing or in the plan.*
-  *Finally, we also consider very positive the fact that the CLPU is starting collaborations with other centers (in the USA, France, and Japan) and that it has submitted applications for several research projects at the European and international level."*

As a brief overview of the main milestones achieved during the period 2013-2016 we could highlight the following, grouped by the four axes which formed the dorsal spine of the CLPU strategy. The main achievements are focused on the infrastructures and services, as the construction and equipping of the Center have been the top priorities of this period.

¹ CACT ("Comité Asesor Científico Técnico", Scientific and Technical Advisory Committee)

Infrastructure & Services	2013	<ul style="list-style-type: none"> ▪ Opening to users of HRR & CEP laser systems, Microscopy and Mechatronics Services ▪ Acceptance Tests of VEGA-1 + VEGA-2 ▪ Application to CSN for 3rd Category Radioactive Facility (X-ray source) ▪ Installation of the compressor chamber of VEGA-1 + VEGA-2 ▪ M5 building (CLPU headquarters) operative ▪ VEGA-1+VEGA-2 operative for tests at M3
	2014	<ul style="list-style-type: none"> ▪ Commissioning of the 3rd Category Radioactive Facility (X-ray station) ▪ Application to CSN for 2nd Category Radioactive Facility ▪ Commencement of the installation of VEGA-3 ▪ Installation of the radioprotection shielding, centralized primary pump, technical corridor, laminar flows and maintenance room for VEGA ▪ Renewal of ICTS with single location ▪ Opening to users of VEGA-2 in M3
	2015	<ul style="list-style-type: none"> ▪ Installation of the compressor chamber of VEGA-3 ▪ Relocation of VEGA-2 from M3 to the laser bay of M5 ▪ Installation of the beam transport for VEGA-2 ▪ Installation of VEGA-3 ▪ Integration of VEGA-1, VEGA-2 and VEGA-3 as a single system. ▪ Design and assembly of VEGA control room ▪ Installation of 1st target area ▪ Installation of the radioprotection safety doors of the target area
	2016	<ul style="list-style-type: none"> ▪ Opening to users of VEGA-1 and VEGA-2 system in M5 ▪ Installation of experimental chambers of VEGA-2 and VEGA-3 ▪ Installation of the beam transport for VEGA-3 ▪ Elaboration of the Access Protocol and draft of the 1st Call to VEGA-2 ▪ Acceptance tests of VEGA-3 system ▪ Operation of Phase III (VEGA-3) in test mode. ▪ Authorization of the 2nd Category Radioactive Facility (VEGA) ▪ Elaboration of a catalog of technological offer including both VEGA and auxiliary systems and consulting.
Research & Results	2013	<ul style="list-style-type: none"> ▪ Interim meeting of CACT ▪ Survey on scientific priorities of potential users ▪ Second meeting of CACT
	2014	<ul style="list-style-type: none"> ▪ Set-up, first tests and end of characterization of the X-ray station ▪ Commissioning of a continuous wave laser set-up as multipurpose pumping system for the Oscillator unit ▪ Third meeting of CACT
	2015	<ul style="list-style-type: none"> ▪ Tests of the experimental setup designed for the characterization of X-ray pulses at the X-ray station of the HRR laser system ▪ Tests and experiments with laser diodes and development of a continuous Ti:Sa laser, for the creation of an amplifier system in the Oscillator Unit ▪ Installation of an atmospheric ToF in Laboratory 3 (CEP laser system)
	2016	<ul style="list-style-type: none"> ▪ Experiment Zero in the experimental station of VEGA-2 ▪ Submission of two European projects, for the programs HORIZON 2020-INFRAIA-2014-2015 and H2020-MSCA-ITN-2017, the last one for the first time as coordinators.

People	2013	<ul style="list-style-type: none"> ▪ Training of the technological staff at the facilities of Amplitude Technologies in France and the headquarters of CLPU
	2014	<ul style="list-style-type: none"> ▪ Staff exchanges with Celia (France), Central Laser Facility (UK) and LULI (France) ▪ Creation of the CLPU Chair ▪ Implementation of the Suggestion Box in the web ▪ Organization of the Advanced School on Lasers Applications at Accelerators, LA3NET
	2015	<ul style="list-style-type: none"> ▪ Creation of the Radioprotection Unit and the Engineering Section ▪ Staff exchanges with Celia (France) and LaserLab Lund (Sweden) ▪ Training of the staff at the facilities of Amplitude Technologies in France ▪ Training of the scientific and technological staff on simulation software (Zeeman, Lascad, ...)
	2016	<ul style="list-style-type: none"> ▪ Implementation of the Personal Safety System (PSS) ▪ Implementation of the Training Plan for CLPU staff ▪ Staff exchanges with GSI Phelix Facility (Germany), Lawrence Livermore National Laboratory (U.S.) and LULI (France)
Society	2013	<ul style="list-style-type: none"> ▪ Organization of the Third Users' Meeting ▪ Organization of the 12th International Symposium on Ultrafast Intense Laser Science (ISUILS12) ▪ Implementation of fees for the services ▪ Educational cooperation agreement for internships with the University of Salamanca
	2014	<ul style="list-style-type: none"> ▪ Implementation of the SAP ERP system ▪ Presentation of the new corporate video of CLPU ▪ New web of CLPU ▪ FARO software as a web tool for requesting access to microscopy ▪ Implementation of the Public Procurement Profile on the web ▪ Approval of the Quality Policy ▪ Organization of the Fourth Users' Meeting ▪ Educational cooperation agreement for internships, final projects and masters with the University of Seville
	2015	<ul style="list-style-type: none"> ▪ Implementation of the Transparency Portal ▪ Organization of Optoel Congress ▪ Organization of the III Meeting of NAUUL (Networking Activity on Ultra-High Intensity Ultrashort Lasers), Laserlab Europe III ▪ Organization of the Fifth Users' Meeting ▪ Project "Despejando sombras" funded by FECYT ▪ Tutoring of final projects of students from the Faculty of Science (USAL) ▪ Grant agreement for Erasmus+ mobility for traineeships ▪ Educational cooperation agreement for internships with vocational schools of Salamanca
	2016	<ul style="list-style-type: none"> ▪ Educational cooperation agreement for internships with the University of Vigo ▪ Organization of the VI Consortia/ICTS Management Workshop ▪ Support to the award granted to Villamayor as "Ciudad de la Ciencia y la Innovacion" (City of Science & Innovation)

Results of the analysis: They are satisfactory since the objectives of the annual plans have been reached in full.

2 Mission & Vision

This Strategic Plan starts up with the definition of CLPU mission, vision and values.

Mission

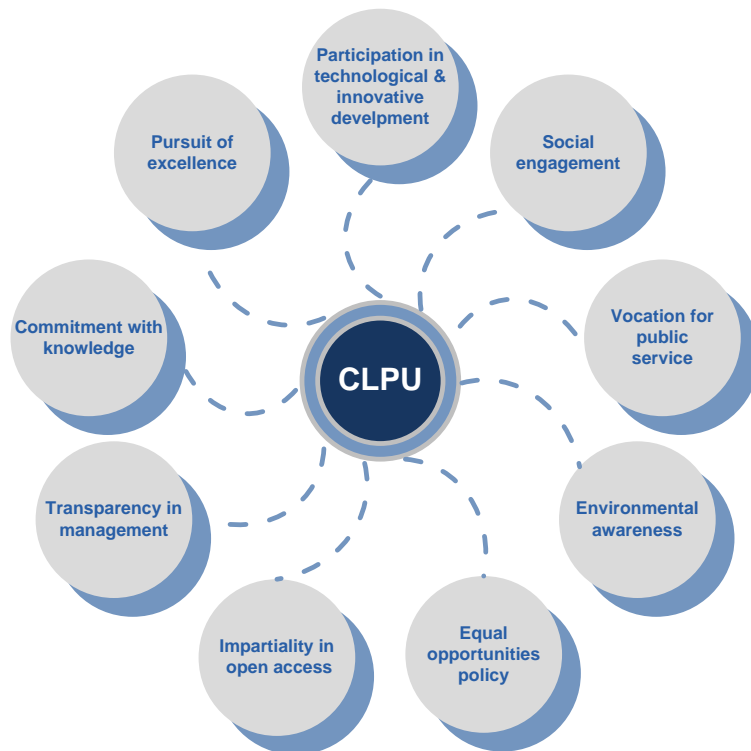
CLPU was born to be the Spanish facility at the forefront in the field of ultra-intense ultra-short pulsed lasers, which could meet the demand of the scientific, technological and industrial community to develop frontier research and projects, through a policy of competitive open access. The in-house scientific expertise would guarantee a cutting-edge top-quality service, working side by side with users from all over the world, while also pursuing its own experimental challenges.

Vision

Thanks to the singularity and uniqueness of our equipment, CLPU is intended to attract excellence research through the most ambitious projects, with proved scientific and strategic interest and a highly innovative value, searching for alliances with stakeholders from all sectors (researchers, academics and industry). Besides, we also intend to be a tool to channel the access of the Spanish scientific community to the top-class European facilities.

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The reference values that guide the Pulsed Lasers Center (CLPU) performance are:



3 SWOT Analysis

The Ultra-short Ultra-intense Pulsed Lasers Center (CLPU) has assessed the internal position of the organization, identifying its main positive (Strengths) and negative (Weaknesses) aspects, to act directly on them, in order to either enhance/reinforce or eliminate them.

Besides, the center has analyzed its external environment and identified the factors that are likely to help (Opportunities) and hinder (Threats) its growth. Although these elements are beyond its capacity, they are taken into account for the design of strategies that allow to take advantage of them or to minimise their impact.



4 Strategic objectives

This new strategic plan coincides with the start-up of VEGA, as a users' facility, which will be performed in two stages, the first will correspond to VEGA-2 and the second to VEGA-3.

During this new period CLPU shall perform the commissioning of VEGA-3 as second-category radioactive facility, being considered a pioneer license in the laser world, not only at national level.

The CACT (Scientific and Technical Advisory Committee) itself is aware of the great advances that have been made in CLPU, but it is also aware of some improvements that must be addressed through the actions included in the strategic plan, especially those related to the temporariness of the staff, as well as the financing of the Center, and what these handicaps represent for the attraction and retention of talent and the offer of good access conditions to users. The CACT members also advice that in a horizon of approximately two years the leading team should define or confirm some specific scientific areas of interest and work on them. Finally, they consider that the relationship with the University of Salamanca, especially through the CLPU Chair, as well as the relationship with other universities in Spain and in other countries, should also be maintained and promoted.

It is also necessary to point out that this Strategic Plan should run parallel with the negotiation by the Consortium members of the Collaboration Agreement, as the present Agreement will only remain in force until December 31st, 2021. Therefore a new scientific and budgetary framework should be established in advance.

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Finally, CLPU will take up new challenges on the uniqueness of the VEGA laser system, the functionality and versatility of the experimental room, the leadership in European R+D+I projects and the decisive commitment to the transfer of knowledge, both in laser technology and applications. Therefore, all the CLPU executive boards and staff will try to make the maximum effort in order to reach the strategic objectives and turn this Center into a world ss ultra-intense laser reference.

4.1 Objectives

Taking into account the global consciousness about the important strategic role of RDI for smart, sustainable and inclusive growth and the particular characteristics of CLPU, the Center considers that our main objectives for this four-year cycle should be the following:

1. Strengthen the Center as a **state-of-the-art facility** in the field of ultra-short ultra-intense pulsed lasers, placing CLPU as a worldwide reference center of science and maintaining the singularity of its equipment.
2. Optimize the use of our infrastructure offering **open access** for the scientific, technological and industrial communities, both national and international, whose proposals shall be

impartially assessed and prioritized, according to excellence criteria and the societal challenges of Horizon 2020.

3. Contribute in bolstering the position of Spain as a world leader in ultrafast laser science, through top-quality cutting-edge scientific and technical **research** in our ground-breaking technology, the building of networks to share ideas and projects, the collaboration with other scientific and technological infrastructures and, as far as we are actually able, the attraction and retention of talent. CLPU also intends to become a tool through which the national scientific community will be granted access to major European facilities.
4. Enhance the cooperation in RDI between the public and the industrial sector, serving as connecting pipe that facilitates the **transfer of knowledge** to all stakeholders to boost regional and national innovation, and the increment of specialized training capacity in RDI that will directly benefit the industrial sector, as well as the society in general.

4.2 Strategies

The strategies linked to each objective are the following:

O.1 OBJECTIVE: Strengthen the Center as a state-of-the-art facility in the field of ultra-short ultra-intense pulsed lasers

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O1.S1 STRATEGY: Guarantee the operation and reliability of the laser systems

CLPU being a user facility with very sophisticated lasers has to consider as the most relevant strategy running those laser systems in optimal conditions. Among such lasers the most relevant one is VEGA. VEGA, with its three arms, gives the uniqueness character to CLPU. Being the peak performances of the laser relevant, it is much more important to ensure that such working conditions are going to be fulfilled during the days of access. Therefore the first strategy is to keep this functionality at least constant in time, planning and foreseen the degradation of the laser according to its use and the rest of working conditions. Being so extreme and having so few lasers operative in the world with these specifications, the prevention has to be based on in-house experience in a very relevant part.

O1.S2 STRATEGY: Enhance the functionality and capabilities of the existing laser systems

The highest priority for CLPU is to keep the ultrafast lasers systems that identify CLPU as a unique facility, in perfect working conditions. Such extreme lasers are by definition very delicate since they are nothing but laser amplifiers taken to the limit. CLPU systems are not far from damage thresholds -that may damage very costly components. To secure its functionality it is necessary a deep understanding of their working principles at a level that can be considered of high-impact international research. Since CPA technology is evolving rather quickly, this strategy also seeks the enhancement of the laser technology and particularly the enhancement of the laser technology research in house. The objective is to start studying the key points of the laser systems existing now at CLPU, as well as the development of new systems and new solutions and functionalities for the existing ones. It seems quite fundamental to keep a constant technological upgrade of the items that justify the uniqueness of this facility. In this context it is worth to consider that CPA technology is quite weak compared to other accelerator technologies. In spite of its fabulous possibilities for particle acceleration and extreme fields -that justify the existence of centers as CLPU- the technology requires a constant effort to be kept properly on shape and to be on the cutting edge.

O.1.S.3 STRATEGY: Enhance the equipment, reliability and versatility of the target area and the experimental stations

The laser delivers the extreme power lasers. However this power is useless without the second part of the facility equipment, the target area. It is necessary to transport the beam to the experiment chamber (experiment station) and to focus it –in many cases- as close as possible to the diffraction limit, taking care of the different problems (vibrations, beam inhomogeneities, aberrations, ...) that can ruin any experiment. This strategy seeks the continuous improvement of the working conditions for the VEGA main target area as well as for the other experimental stations. The strategy seeks to give our users well equipped, versatile and reliable working experimental stations. Also we seek to provide users a clear identification of the laser parameters. At this moment there is only one target area for VEGA, the internal target area. A plan for expansion of the center is foreseen within this strategy with the possible definition of a new target area (the external target area, to be built on underground of what is now the front garden). For this strategy it is very relevant the feedback of the users. At the end CLPU is looking for users' needs, scientific results and satisfaction. So those projects need a lot of the user response and have to be implemented after the first campaigns. Also we consider that a continuous improvement of the experimental conditions is something that can attract users, particularly the kind of collaborative users that we are looking for.

O1.S4 STRATEGY: Improvement of the efficiency and safety of the experimental environment of the facility.

This strategy seeks to channel actions to consider the CLPU a safe infrastructure from the radiological point of view (CSN licenses, magnetic dosimeters, TLD readers, detectors functionality and improvement of the Personal Safety System) as well as an energy efficient installation (reduction of energy consumption, energy recycling, alarm management, improvement of critical points,...). Besides, for an organization to function effectively, it has to determine and manage numerous linked activities. The Center has already identified the processes involved in its everyday activity and core business and the interaction among these processes, as a mean of consistently providing services that meet users and applicable regulatory requirements. The next step will be obtaining an official quality certification according to International Standards.

O.2. OBJETIVE: Optimize the use of our infrastructure offering open access for the scientific, technological and industrial communities

O2.S1 STRATEGY: Implementation of a competitive access system to the services and facilities of CLPU.

CLPU being a user facility has to offer competitive access of the main equipment, the VEGA system. Competitive access is the key identity element of a user facility as CLPU and thus has to be strategically considered at the highest level. The access panel has to have a clear idea on the realistic possibilities of CLPU at each call. For that the Center has to prepare proper documentation and to keep it updated. Users may afford long trips to come to Salamanca and so the risk to last minute failures of the system has to be very carefully accounted for. So access has to be based on realistic possibilities, since the offering of the possibilities without the proper development can have a negative effect on the Center potential users. The goal for this strategy is to prepare the access system on a realistic basis.

O2.S2 STRATEGY Increase the capacity of attraction of users to our facility.

Scientific users are the real clients of CLPU. They enter the user system through competitive access and are using public resources. The goal of CLPU is to bring to Salamanca the highest recognized research groups around the world and collaborate with them to learn new techniques and bring to Salamanca new tools. To do this it is worth to establish collaborations/links with the best teams in Europe. This can be done with the use of platforms as LaserLab Europe or as the three pillars of ELI, as well as the European XFEL or other outstanding initiatives that are under development. The knowledge has to be transferred to the technological and industrial sectors, mainly inside Spain and Europe.

O2.S3 STRATEGY: Optimize access results and the user satisfaction.

It is important for CLPU not only to grant access to significant proposals from the scientific point of view, but also to participate to certain point in the results obtained, as a means of obtaining a return of the investment to some extent. So in those cases in which the participation of the Center or its staff does not justify a co-ownership of the results, we have to keep track of the results, as these may be come to light long after the completion of the experimental campaign, for instance in the case of papers, publications, patents, thesis, and so on. Besides, it is also essential to seek the views of users regarding our performance during the campaigns so as to continuously improve the services that we offer, and thus to cement our credibility in the scientific and technological community.

O3. OBJECTIVE: Contribute in bolstering the position of Spain as a world leader in ultrafast laser science

O3.S1 STRATEGY: Alignment of CLPU with the international mainstreams, particularly in relation to PW centers.

Machines as VEGA represent the state of the art of the technology. Their day-to-day operation is fairly non-trivial and the development is very complex. VEGA has the strength of its high repetition rate (one shot per second for VEGA-3) that give it its world-class uniqueness. However this implies a delicate job of collaboration to other centers. The surveillance of other facilities that develop solutions, particularly on high repetition targets, is fundamental for CLPU as well as the enhancement of joint experiments. Also the close collaboration with ELI seems quite relevant. Although this collaborations is going to be difficult if Spain does not join in a way or another the ELI-ERIC, or if Spain does not establish bilateral relations to the ELI-Pillars.

O3.S2 STRATEGY: Strengthen the action lines aimed at attracting and retaining talent and establish the basis for an excellence research production in experimental science.

One of the most important, if not the most, points for the correct operation of the center is the existence of a motivated staff, highly specialized. The present situation in Spain does not allow the permanent hiring of personnel in optimal conditions. Also salaries are not competitive internationally. Those are regulations that come directly from the Spanish Government and that affect all Public Consortia. The impossibility to proceed in any other way forces us to prepare a double strategy: Attraction of talent on a permanent basis, whenever possible, and attraction of talent on a temporary basis (three years or more). The last point takes profit of the uniqueness of our facility. The attraction of young students and recent doc can be achieved if the stay at Salamanca can be valued as an internationally valuable boost of their careers thanks to the cutting-edge research developed by our personnel. This is the point that has to be reinforced to attract talent as an adaptation to the present scenario of non-permanent jobs and reduced salaries.

O3.S3 STRATEGY: Foster the participation of CLPU in national and international networks with a scientific or technical basis.

CLPU has been very relevant so far to create the Spanish Community on ultrafast lasers. The CONSOLIDER-INGENIO project lead from Salamanca was the starting of this community. Now the legacy of that project is the existence of a community in Spain under the umbrella of the Spanish Society of Physics, GELUR, the Specialized Group on Ultrafast Lasers (Grupo Español de Láseres Ultra-Rápidos). The interplay between those groups is fundamental for the evolution of the community and for its international projection. Also CLPU has to encourage the use of ultraintense lasers among the Spanish community. Finally it is relevant to establish synergies with the existing community of particle acceleration (that uses conventional accelerators) to show the benefits and the disadvantages of laser acceleration.

O4 OBJECTIVE Enhance the cooperation in RDI between the public and the industrial sector

O4.S1 STRATEGY: Foster the resources and procedures to encourage the knowledge transfer created in the CLPU towards the industry.

The purpose of this strategy is to create the structure for the correct technology transfer. We consider a project to strength the training related to the knowledge transfer. To reach the potential interested sectors, CLPU will elaborate, publish and disseminate a Technology Portfolio, devoted on all the technology where the center can present innovative solutions. The goal is not to generate competition with Spanish private companies, but synergies with them, as well as identify and attract groups interested in KT to reach mutually beneficial collaborations. For us, it means an important return to society of the investment made in the Center in research and technology, and at the same time, CLPU gains new perspectives on possible directions and approaches for research and technological development.

O4.S2 STRATEGY: Promote activities to let society know about the laser center and the laser technology possibilities

This strategy includes activities to show CLPU and its possibilities to society at a basic level but serious enough to display our real potential and to understand the complexity level and uniqueness of this facility. In this context CLPU has to make a special effort to give visibility to its activities and to transfer the results of the users, particularly of the competitive access users, once these results have been published. CLPU has to glue and “digest” all those information and to present those results and possibilities in a well prepared form to different target communities (acceleration, neutrons ...).

O4.S3 STRATEGY: Organize activities in the education field that allow the training and the promotion of scientific vocations.

CLPU has to establish formative programs either through the University of Salamanca or through other institutions in Spain or abroad. The objective is to transfer the knowledge to the educative sector to form graduates and doctors with outstanding capabilities to work in other large-scale facilities (as ELI). CLPU -by indication of its Scientific Advisory Committee (CACT)- established a few years ago a Chair, the CLPU chair, at the University of Salamanca. Besides the scientific duties on plasma science, the CLPU Chair is in charge of the education and knowledge transfer. CLPU must try to be linked to European initiatives at this level (Erasmus, etc.) in the measure of the possibilities and proportional to the number of scientists. Also CLPU has to generate educative material at a conveniently high level, understandable to PhD students as well as to engineers and other industrial sectors without advanced knowledge of Physics. Finally it is the responsibility of the CLPU staff to develop “a la carte” documents to explain the future possibilities of CLPU to interested entrepreneurs and technologists and to open new sectors. To certain extent we can say that the target user is a company non-related to lasers that does not considers lasers now on its plans.

4.3 General actions for developing the strategies

O.1 OBJECTIVE: Strengthen the Center as a state-of-the-art facility in the field of ultra-short ultra-intense pulsed lasers.				
STRATEGY	GENERAL ACTIONS	START	END	RESPONSIBLE
O1.S1 Guarantee the operation and reliability of the laser systems	O1.S1.A1 General & Specific Preventive Maintenance Plan of VEGA system and its components	2017	2019	HTD
	O1.S1.A2 Establish a management system for the purchase and replacement of components and spare parts	2017	2018	HTD
	O1.S1.A3 Implementation of the operation modes of VEGA-3	2017	2020	HTD
	O1.S1.A4 Monitoring of the functioning parameters & risk management in the operation modes	2017	2020	HTD
O1.S2 Enhance the functionality and capabilities of the existing laser systems.	O1.S2.A1 Enhance the quality of the operating parameters of the system (Pulse, contrast, beam profile,...)	2017	2020	HTD
	O1.S2.A2 Increase the capacities of VEGA system (synchronization and CEP)	2017	2020	HTD
	O1.S2.A3 Improve the repetition rate of VEGA system	2017	2020	HTD
O.1.S.3 Enhance the equipment, reliability and versatility of the target area and the experimental stations.	O1.S3.A1 Ensure the functionality of the VEGA system in the target area	2017	2020	HSD
	O1.S3.A2 Optimize the equipment of the target area	2017	2020	HSD
	O1.S3.A3 Versatility of the experimental stations and auxiliary services	2017	2020	HSD
	O1.S3.A4 Optimization and improvement of the TA network and data processing system	2017	2020	HSD
O1.S4 Improvement of the efficiency and safety of the experimental environment of the facility.	O1.S4.A1 Turn CLPU into a reference infrastructure in certifications, dosimetry and radiological protection procedures	2017	2020	HRPU
	O1.S4.A2 Implement measures to promote energy efficiency and recycling and foster safety procedures	2017	2020	HES
	O1.S4.A3 Implementation of a Quality System	2017	2020	MD

O.2. OBJECTIVE: Optimize the use of our infrastructure offering open access for the scientific, technological and industrial communities.

STRATEGY	GENERAL ACTIONS	START	END	RESPONSIBLE
O2.S1 Implementation of a competitive access system to the services and facilities of CLPU	O2.S1.A1 Implement the necessary procedures and tools for the operation of CLPU as a user facility	2017	2020	MD
	O2.S1.A2 Planning and execution of the access to VEGA-1 & VEGA-2	2017	2020	D
	O2.S1.A3 Planning and execution of the access to VEGA-3	2018	2020	D
	O2.S1.A4 Implementation of access to VEGA with new operation modes and secondary sources	2019	2020	HSD
O2.S2 Increase the capacity of attraction of users to our facility	O2.S2.A1 Reinforce the image of CLPU as a user facility	2017	2020	D
	O2.S2.A2 Promote agreements and strategies to increase the interest of users in our facilities	2017	2020	D
	O2.S2.A3 Obtain funding sources for access	2017	2020	D
O2.S3 Optimize access results and the user satisfaction	O2.S3.A1 Develop a system for monitoring the results of accesses and their indicators	2017	2020	MD
	O2.S3.A2 Implement a quality system for the analysis of the user satisfaction	2017	2020	MD

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O3 OBJECTIVE: Contribute in bolstering the position of Spain as a world leader in ultrafast laser science

STRATEGY	GENERAL ACTIONS	START	END	RESPONSIBLE
O3.S1 Alignment of CLPU with the international mainstreams, particularly in relation to PW centers	O3.S1.A1 Technological and scientific surveillance	2017	2020	D
	O3.S1.A2 Collaborative and co-funding actions with other infrastructures	2017	2020	SKS
	O3.S1.A3 Approach actions to the three sites of ELI	2017	2020	SKS
O3.S2 Strengthen the action lines aimed at attracting and retaining talent and establish the basis for an excellence research production in experimental science	O3.S2.A1 Implement actions for attracting new researchers	2017	2020	MD
	O3.S2.A2 Reinforce the skills and opportunities for professional development in the scientific and technical fields	2017	2020	MD
	O3.S2.A3 Active participation in the training of future researchers and technicians of intense lasers	2017	2020	SKS
O3.S3 Foster the participation of CLPU in national and international networks with a scientific or technical basis.	O3.S3.A1 Enhance the role of CLPU in the coordination of the Spanish scientific laser community	2017	2020	SKS
	O3.S3.A2 Analyze the possibilities of converting CLPU into a distributed RI	2017	2020	D
	O3.S3.A3 Increase the participation of CLPU in international networks and contribute to their visualization	2017	2020	D

O4 OBJECTIVE Enhance the cooperation in RDI between the public and the industrial sector

STRATEGY	GENERAL ACTIONS	START	END	RESPONSIBLE
O4.S1 Foster the resources and procedures to encourage the knowledge transfer created in the CLPU towards the industry.	O4.S1.A1 Strengthen the culture and training related to the knowledge transfer	2017	2020	MD
	O4.S1.A2 Review and improve the management of the technological offer	2017	2020	MD
	O4.S1.A3 Foster collaborations in the public-private sphere	2017	2020	D
O4.S2 Promote activities to let society know about the laser center and the laser technology possibilities	O4.S2.A1 Make CLPU and its activities visible	2017	2020	MD
	O4.S2.A2 Improve the communication channels and their contents related to dissemination	2017	2020	MD
	O4.S2.A3 Enhance the transparency policy and electronic administration	2017	2020	MD
O4.S3 Organize activities in the education field that allow the training and the promotion of scientific vocations	O4.S3.A1 Enhance the CLPU Chair activities	2017	2020	SKS
	O4.S3.A2 Generation of optic and laser teaching material	2017	2020	D

Legend of Acronyms	
D	Director
MD	Managing Director
SKS	Senior Key Scientist
HTD	Head of Technological Division
HSD	Head of Scientific Division
HRPU	Head of Radioprotection Unit
HES	Head of Engineering Section

4.4 Resources

4.4.1 Human Resources

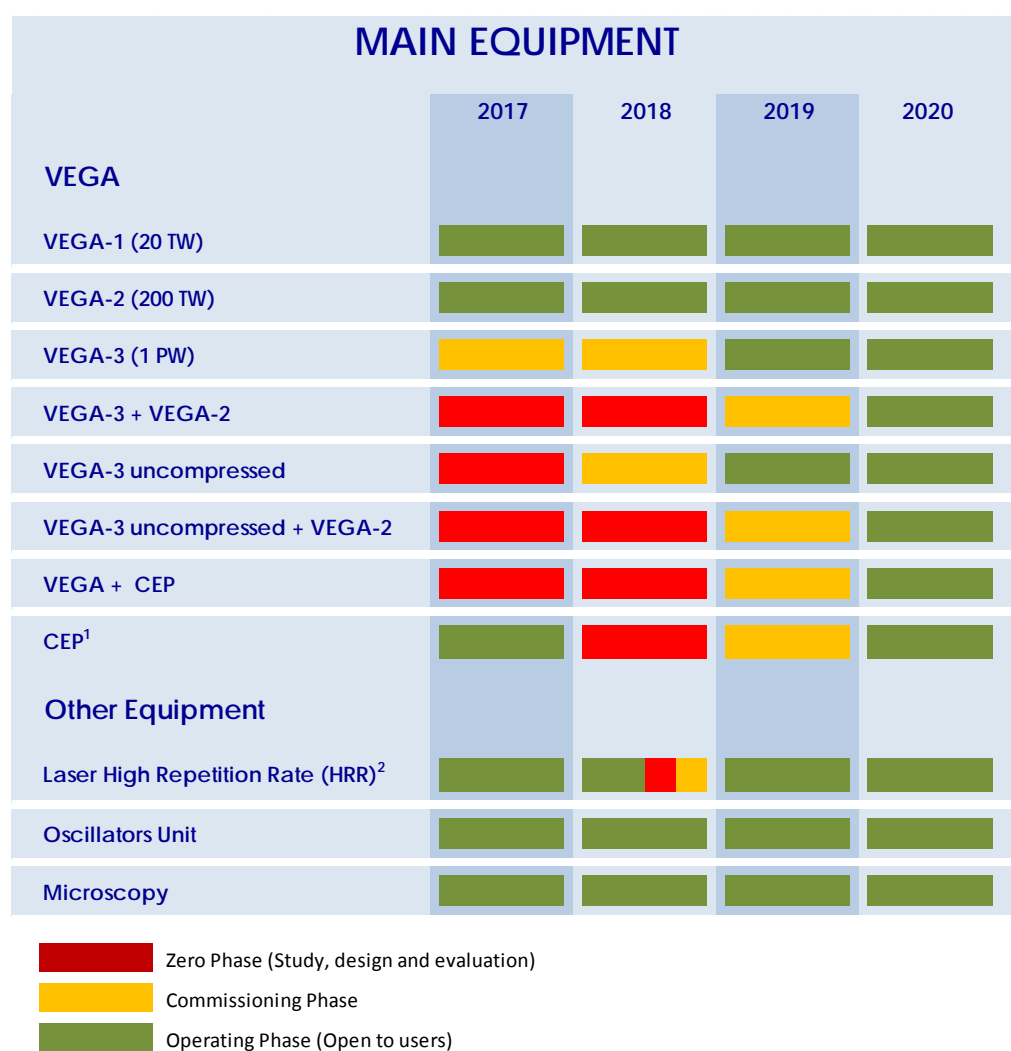
These figures represent the average of structural staff. The staff will be completed with casual personnel around research and technological projects.

HUMAN RESOURCES																									
	2017						2018						2019						2020						TOTAL
	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	
Structural Staff	31						34						43						43						43
Technical Area																									
Specialist Technicians	■	■	■	■			■	■	■	■			■	■	■	■	■	■	■	■	■	■	■	■	12
Technicians	■	■	■	■	■		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
Others	■												■	■				■	■						
Scientific Area																									
Senior Scientists	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	12
Scientists	■	■	■	■			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
Others																									
Management Area																									
Senior Management	■						■						■						■						10
Management Specialists	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
Others	■	■					■	■	■				■	■	■	■	■	■	■	■	■	■	■	■	
Engineering Division																									
Specialist	■						■						■						■						6
Technicians	■	■	■	■			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
Other							■						■						■						
Radioprotection Division																									
Specialist	■						■						■						■						3
Others	■												■	■				■	■						

Note: In addition to these structural personnel, the University of Salamanca (USAL) has appointed two of its staff members to fill the positions of Director of the CLPU and Director of the CLPU Chair, according to the Agreements signed with this institution on October 26th, 2009 and July 17th, 2014, respectively, and subsequent extensions.

4.4.2 Material Resources

The following graphic gives details of the foreseen availability of the main laser system of the Center, VEGA, in all its possible configurations, as well as the other ancillary services open to users. The colours represent the stage of evolution of the development and implementation of the services and their opening to users.



¹ The Carrier Envelope Phase laser (CEP) is going to be reinstalled in the VEGA laser room of the M5 building, CLPU headquarters. The CEP will be able to operate either jointly with the VEGA laser or independently. In any case, the experiments will be performed in the experimental room (commonly known as Target Area) of the VEGA system. To accomplish all this, it will be necessary to carry out a series of complex tasks (including the modification of the radiation shielding and the integration into the VEGA system) that are expected to begin in 2018 and last until late 2019.

² The High Repetition Rate laser (HRR) is also going to be moved from the M3 building of the Scientific Park to the laboratories area of the M5. This transfer implies that the service will be at a halt of about 6 months.

4.4.3 Economic Resources

Thousand euros (k €)	2017	2018	2019	2020
INCOME	2,635	2,609	2,832	3,028
Consortium Funds	2,208	2,252	2,297	2,343
Projects Incomes	377	307	435	490
Services Incomes	50	50	100	195
EXPENSES	2,635	2,609	2,832	3,028
Personnel	1,492	1,414	1,450	1,480
Running Expenses	1,043	1,090	1,182	1,248
Equipment Upgrade	100	105	200	300

Approval of the Annual Budgets. Annually the Executive Commission shall render a proposal of Annual Budgets for CLPU to the Rector Council.

5 Chronogram & Monitoring

5.1 Chronogram

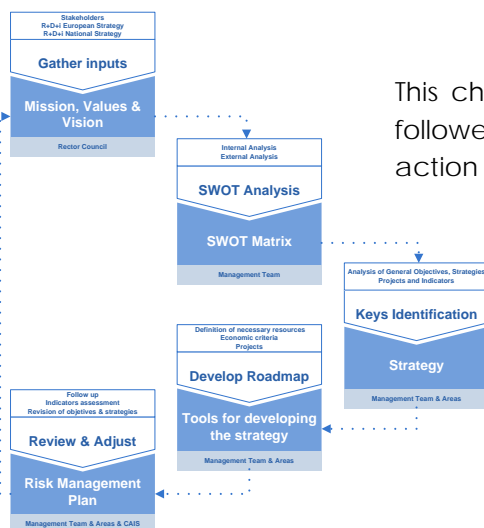
This Strategic Plan will be reviewed periodically by the competent bodies of CLPU, through several actions:

- **Approval of the Annual Budgets.** Annually the Executive Commission shall render a proposal of Annual Budgets for CLPU to the Rector Council. The Annual Budget will determine the resources at the disposal of the Center to programme activities and accomplish objectives.
- **Approval of the Annual Plan of Actions and Projects.** The Center will submit annually to the Executive Commission a Plan of Actions and Projects to be implemented the following year. If the Plan is accepted by this governing body, it will be submitted to the Rector Council for its approval.
- **Follow-up of the set of actions and indicators** established to implement the strategies defined in order to achieve the main objectives of the Center. At a first stage, the Executive Platform (Director, Managing Director and the Heads of Division) will be in charge of gathering and assessing all the information regarding the degree of compliance with the previous year Plan, elaborating a report which shall be submitted to the Executive Commission for its evaluation and approval.
- **Implementation of the Risk Management Plan and decision on required adjustments.** The Executive Platform will response to any risk or contingency as soon as it would arise, implementing the foreseen mitigation strategies or taking any other appropriate measures to minimized the impact on the smooth functioning of the Center. In case that due to obvious deviations from the timetables, some actions were unlikely to be completed in the specified timeframe, they will be re-scheduled and the reason for the delay shall be justified to the Secretariat of the Executive Committee of the Council of Science, Technology and Innovation Policy.
- **Renegotiation of the Collaboration Agreement** signed by the three Consortium members for the creation of the CLPU. According to Clause 12, the Agreement will remain in force until December 31, 2121. However, it may be extended expressly, with a minimum notice of six months, for periods equal to or less than five years. Considering all the bureaucracy involved, a longer period shall be necessary for the negotiation, which is scheduled to start at least in 2019.

- **Counselling and report from the CACT.** The CACT advises on activities, programs and scientific plans that the Director submits to the Executive Commission. Additionally, the CACT prepares a four-year report on the future opportunities, prospects and capabilities of CLPU. This report is directly presented to the Rector Council to assist in the strategic orientation of the Center.
- **Comprehensive review of the Strategic Plan.** The Executive Platform shall check the degree of compliance of the objectives set at the Plan and analyse their validity or whether, on the contrary, new measures should be taken to place CLPU as a state-of-the-art facility for the scientific and technological research and development. This will be carried out at least a year in advance to the elaboration of the next Strategic Plan. Requests to modify and update the Strategic Plan will be sent to the Secretariat of the Executive Committee of the Council of Science, Technology and Innovation Policy. This body, through the Advisory Committee on Singular Infrastructures (CAIS), must assess whether the proposal substantially affects the Strategic Plan, so that require an integral evaluation of the same, or if on the contrary it is appropriate to evaluate only those individual elements of the Plan affected by the modification.

Therefore, the chronogram will be as represented in the following diagram:

CHRONOGRAM					
	COMPETENT BODY	2017	2018	2019	2020
Approval of Strategic Plan	Rector Council	█			
Approval of Annual Budgets	Rector Council	█	█	█	█
Approval of Annual Plan of Actions and Projects	Rector Council	█	█	█	█
Follow-up of fulfilment of actions and indicators	Executive Commission	█	█	█	█
Implementation & revision of Risk Management Plan	Executive Platform	█	█	█	█
Renegotiation of the CLPU Agreement	Rector Council			█	█
Counselling and report from the CACT	Executive Platform	█		█	
Revision of Strategic Plan	Executive Platform			█	



This chart flow on the left represents the procedure followed to identify and establish the objectives and action plan of CLPU.

5.2 Indicators

The Center has established a set of general indicators that will periodically be checked out to evaluate the adequate progress of the ICTS. Each of these indicators has their associated specific indicators – generally of a numerical nature - to verify different issues related to them.

O.1. OBJECTIVE: Strengthen the Center as a state-of-the-art facility in the field of ultra-short ultra-intense pulsed lasers.	
Indicator	Annual Value
Annual Nr. of operative hours of the laser (VEGA-1, VEGA-2, VEGA-3, VEGA-2 + VEGA-3, VEGA-2 + CEP, VEGA-3 + CEP, VEGA on air)	600 h – 800 h
Annual Nr. of shots in single shot mode (VEGA-1, VEGA-2, VEGA-3, VEGA-2 + VEGA-3, VEGA-2 + CEP, VEGA-3 + CEP, VEGA on air)	> 6000 shots
Annual Nr. of minutes in continuous mode at 1Hz (VEGA-3 compressed, VEGA-3 on air, VEGA-2 + VEGA-3, or VEGA-3 + CEP)	> 120 min (from 2019 onwards)
Annual Nr. of minutes in continuous mode at 10Hz (VEGA-1, VEGA-2, VEGA-2 + CEP, VEGA-2 on air)	> 120 min (from 2019 onwards)
Nr. of cancelled sessions due to laser malfunction.	< 15%
% of sessions completed related to the sessions granted	> 80%
Nr. of parameters measured in the TA metrology bench	2 – 5 parameters
Energy at focus (Joules) in VEGA-2	4 J - 6 J
Energy at focus (Joules) in VEGA-3	10 J - 30 J
Intensity at focus (Watt/Centimeter) in VEGA	10 ¹⁸ - 10 ²¹ W/Cm ²
Nr. of experiments with technologies pump-probe or similar	> 50%
Reduction of beam inhomogeneity for VEGA-3	< 13%
Improvement of the initial contrast rate	100 dB in the 50 ps region
Increment of the fluence pre-compression for VEGA-3	> 10%
Reduction of cryogenic vibrations	< 20%
Nr. of operation hours of VEGA in radioactive mode	300 h – 400 h
Nr. of radiation protection incidents in relation to operation hours of VEGA in radioactive mode (or sessions of experimental campaigns)	< 1%
Nr. incidents with the Personal Safety System (PSS) in relation to sessions of experimental campaigns	< 3%
Nr. of training hours on safety & risk prevention issues	100 h -200 h
Nr. of licenses of supervisors & operators of radioactive installations	5-10% staff

O.2. OBJECTIVE: Optimize the use of our infrastructure offering open access for the scientific, technological and industrial communities.	
Indicator	Annual Value
Nr. Sessions requested vs. Nr. Sessions offered in competitive access	> 1,5%
Ratio access (experimental campaigns) through competitive call vs. non-competitive	> 50%
Ratio access (sessions) through competitive call vs. non-competitive	> 60%
Nr. of sessions offered in open (competitive) access	80 - 100
% of users' satisfaction regarding the technological support	> 70%
% of researchers requesting an additional experimental campaign	> 10%
Nr. of collaborative campaigns vs. total number of campaigns	> 20%
Average Nr. of institutions taking part per campaign	> 2
Average Nr. of countries taking part per campaign	> 2
Nr. of publications with acknowledges as a result of the access to CLPU facilities per campaign	1 - 3

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O.3. OBJECTIVE: Contribute in bolstering the position of Spain as a world leader in ultrafast laser science	
Indicator	Annual Value
Nr. of members of the staff hired through projects	5 - 10%
Nr. of training hours of scientific and technological scope	150 -300 h
Nr. of staff in annual mobility programs	1 - 3
% of Spanish researchers taking part in access proposals in CLPU	5 - 10%
% of Spanish researchers taking part in experimental campaigns in CLPU	3 – 5%
Nr. of projects with an in-house PI	3 - 5
Nr. of proposals submitted by CLPU researchers to competitive access per call	1 - 2
Nr. of Undergraduate, Master, Postgraduate, Doc trained annually at CLPU	2 - 4
Total Nr. of publications from CLPU personnel	15 - 25
% of publications in journals positioned in the 1st quartile in its thematic area	10 – 20%
% of publications in journals positioned in the 2nd quartile in its thematic area	10 – 20%
Ratio publications (papers, books, presentations, posters) vs. Nr. of CLPU researchers	> 1
Ratio publications (papers, books, presentations, posters) vs. Nr. of CLPU doctors	> 1
Annual campaigns in other facilities	1 - 3

O.4. OBJECTIVE: Enhance the cooperation in RDI between the public and the industrial sector	
Indicator	Annual Value
Nr. of KT training hours in the annual training plan	> 1%
Annual Nr. of activities of KT (NDAs, patents, licensed patents, R+D+I contracts)	3 - 5
Annual increment of visits to the Center	1 - 2%
Annual increment of Nr. of web visitors	1 - 2%
Nr. of activities per year in educational institutions	> 3
Annual increase the bits uploaded in the CLPU website	2
Nr. of courses completed through the e-learning platform	> 30
Nr. of training programs offered in the e-learning platform	> 5

6 Risk Management Plan

There are several factors or threats, which, if materialized, could mean a major drawback for the accomplishment of the objectives set in this Strategic Plan. They have been summarized into five main risks for the period 2017 -2020 and we have analysed the possible measures to minimise the severity of the consequences of such risk events if they occur.

Nº	Description	Failure motive	Level of impact	Likelihood	Monitoring	Mitigation
1	Delays or cancelations of experimental campaigns	Laser system not available	High	Probable	<ul style="list-style-type: none"> Monitoring of the laser parameters (database with the evolution of the laser parameters) 	<ul style="list-style-type: none"> Maintenance Plan Stock of spare parts of critical elements of the laser system Alternative providers
		Lack of resources needed	High	Possible	<ul style="list-style-type: none"> Coordination with PI of the external experimental teams Analysis of the users' requirements 	<ul style="list-style-type: none"> Planning of experimental campaigns well in advance Temporary assignment of equipment belonging to users Acquisition of equipment with external funding
2	Lack of users (Laser beam offer higher than demand)	High access costs	High	Probable	<ul style="list-style-type: none"> Nr. of Service requests submitted by users 	<ul style="list-style-type: none"> Collaboration agreements with research centers and private partners
		Lack of awareness of our services or the applicability of lasers among the scientific and industrial community	Medium	Possible	<ul style="list-style-type: none"> Activity rates of the services 	<ul style="list-style-type: none"> Update & promotion of the service catalogue Display of successful experimental results
3	Obsolescence of equipment	Lack of adaptation of the laser system to the avant-garde technology	Medium	Possible	<ul style="list-style-type: none"> Regular analysis of the state of the art Surveillance of equipment operated in other cutting-edge laser infrastructures and their development plans 	<ul style="list-style-type: none"> Implementation of technological developments and upgrades In-house technical development Training of the technical division staff
4	Funding of the Center	Insufficient funding to provide for the needs of the Center as an ICTS	High	Probable	<ul style="list-style-type: none"> Budgetary control Negotiation with the Consortium partners Regular state, European and international aids monitoring 	<ul style="list-style-type: none"> Renewal of the CLPU Consortium agreement Funding through research projects Funding through services to industry
5	Lack of in-house research	Lack of funding	High	Possible	<ul style="list-style-type: none"> Projects developed Papers annually published by CLPU researchers Conferences given and posters submitted in congresses 	<ul style="list-style-type: none"> Joint research projects with external researchers Submission of research proposals for competitive access
		Brain drain	Medium	Possible	<ul style="list-style-type: none"> Annual analysis of the evolution of staff 	<ul style="list-style-type: none"> Implementation of the EURAXESS initiative Establishment of an attractive training and career plan

Salamanca, May 3rd, 2018

Luis Roso
Director



Annex: CACT Report



Prof. Dr. Luis Roso
Director of CLPU
Salamanca

Dear Prof. Roso,

Concerning the Strategic Plan for CLPU that you are presenting, I declare that it is in accordance with the main guidelines indicated by the Scientific and Technical Advisory Committee (CACT) in its last report.

Terrassa, March 23th, 2018

A handwritten signature in blue ink, appearing to be 'R. Vilaseca', is located below the date.

Signed: Ramon Vilaseca,
Professor of Applied Physics at the Universitat Politècnica de Catalunya
Chairman of the CLPU Scientific and Technical Advisory Committee.