CLPU – Centro de Láseres Pulsados
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RESOLUTION OF THE DIRECTOR OF THE CONSORTIUM FOR THE DESIGN, CONSTRUCTION, EQUIPMENT AND EXPLOITATION OF THE SPANISH PULSED LASERS CENTER (CLPU), DATED APRIL 13TH, 2018, IN WHICH THE REGULATORY BASES OF THE SECOND CALL FOR ACCESS TO THE VEGA LASER SYSTEM ARE APPROVED[1].

1 Aim of the Call

The following terms aim to regulate the conditions for the access of researchers from Spanish or foreign institutions, whether public or private, to the VEGA Laser System, to develop scientific experimental proposals and public or public-private collaborative projects, as well as the beam time allocation to the aforementioned.

To this end, the CLPU will consider as scientific experimental proposals those whose results may be published and disseminated, thus becoming part of scientific literature.

Similarly, the CLPU will consider as public or public-private collaborative projects those resulting from an agreement signed by the CLPU and other public or private institutions for the development of an experiment of common interest for both parties.

Those applications containing commercial or industrial proposals in which the participating researchers will use the results in a confidential manner, thus not willing to publish and disseminate the achieved results in scientific literature due to commercial purposes will be excluded from this call for access. In such cases, an appropriate contract will have to be signed with the CLPU.

2 Eligibility criteria

From a general standpoint, the requirements that should be matched by applicants are:

- Applicants must be researchers and/or technologists preferably with experience in experimental campaigns that develop their work in a technology institute, or in a scientific or academic institution, either national or international. If this requirement is not met, an appropriate collaboration agreement with the CLPU may be signed, as indicated in the previous section.
- By submitting the application, the terms of the call are accepted by all the participants, who thus commit to submit all the required documents for a correct evaluation of the application.
- The applications must be submitted in English.

[1] ***This new version includes corrections to the original text issued on April 10th, 2018.***

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3 Offered Access

VEGA-2 is in regular experimental operation and VEGA-3 will be in commissioning phase until the end of 2018. This is the second Call for Competitive Access but the first access to VEGA-3 and, therefore, what is offered in terms of the Petawatt is limited. We also offer our preliminary secondary sources.

The laser VEGA is a CPA Titanium:sapphire system, with a central wavelength of 800 nm +/- 10 nm. It hast three arms with a maximum power 20 TW (VEGA-1), 200 TW (VEGA-2) and 1 PW (VEGA-3).

The common front-end has a double CPA as well as an XPW system that increases the contrast of the pulses significantly, making it suitable for high density targets. The temporal contrast is: @ns (replica) $5 \cdot 10^{-10}$; @1 ps $2 \cdot 10^{-5}$, @5 ps $5 \cdot 10^{-8}$; @10 ps $8 \cdot 10^{-9}$, @100 ps $5 \cdot 10^{-12}$.

In particular, we offer access to VEGA-2 and VEGA-3 lasers, as well as some secondary sources from VEGA-2.

VEGA-2:

Laser Beam:

- The VEGA-2 laser beam is offered linearly polarized (electric field with horizontal polarization) and in two different configurations depending on the parabolic mirrors used:
  - Long Focal configuration with F=130 cm (F/13) giving a final focal spot of around 20 microns (FWHM) positioned at 30 cm distance from the center of the chamber.
  - Short Focal configuration with F=40 cm (F/4) giving a final focal spot of around 6 microns (FWHM) positioned in the center of the chamber.
- The essential parameters of the VEGA-2 laser are: duration not shorter than 25 fs, and peak energy not larger than 5 J, at the exit of the pulse compressor.
- The mode of operation can be varied from single shot up to 10 Hz
- We are also open to feasible VEGA-2 configuration proposals, such as pump-probe.

Experimental station:

- A cylindrical vacuum chamber of 120 cm in diameter that surrounds the focal point. The chamber is set so that the Long focal point remains 30 cm before the TCC (Target Chamber Centre) and short focal point remains in the TCC. This chamber is in a vacuum of 10^{-6} millibar. The cylindrical vacuum chamber has a series of windows appropriate for connection of detection systems, or a line of sight viewing. Detailed information can be found in the web (www.clpu.es).
- Possibility of additional vacuum chambers, typically of 610 mm in diameter.
- Fixing and positioning systems for solid targets for experiments with high-density targets.
- Fixing and positioning systems for gas valves pulsed for low density targets.
- Any devices provided by the user have to be previously tested and approved by CLPU team.

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VEGA-3:

Laser Beam:

- The VEGA-3 laser beam is offered linearly polarized (electric field with horizontal polarization) in long focal configuration with F=250 cm (F/10) giving a final focal spot at the TCC of around 14 microns (FWHM).
- The essential parameters of the VEGA-3 laser are: pulse duration at full power not shorter than 27 fs, and peak energy not larger than 27 J, at the exit of the pulse compressor.
- The mode of operation varies from single shot up to 10 Hz.
- The focal spot is out of the focalization chamber in a separate one that can be setup according to the user needs.

Experimental station:

- A cylindrical vacuum chamber, the focusing chamber with several options in diameters.
- Fixing and positioning systems for solid targets for experiments with high-density targets.
- Fixing and positioning systems for gas valves pulsed for low density targets.
- Any devices provided by the user have to be previously tested and approved by CLPU team.

SECONDARY SOURCES FROM VEGA-2:

The long-term aim of the center is to offer secondary sources, i.e. sources obtained from the VEGA laser interaction with convenient mediums. This is under development, but at this time we can offer, always in commissioning mode (all those sources use VEGA, so users of the sources will have a limited use –if any- of VEGA),

- A source of Laser Wakefield Accelerated (LWFA) electrons, with energies of 100-500 MeV
- A source of betatron x-ray radiation of several KeV coupled eventually with a KB focusing system.
- A source of Target Normal Sheath Accelerated (TNSA)
- A source of protons with energies in the range from 1 to 10 MeV

Those sources represent an extraordinary opportunity for scientists interested in measuring and applying pulsed radiation (pulsed X-rays, pulsed particle beams, etc.) in the femtosecond regime.

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ADDITIONAL ITEMS INCLUDED IN THE OFFER

Targets:

It is highly recommended that the users contact CLPU staff for the correct implementation of targetry devices, as this is a continuously developing area and new target possibilities may be available. At this moment, the center can provide:

- A three axis motorized moderate repetition rate (~ 0.01-0.1 Hz) system with a target holder hosting up to 256 possible shots.
- Several sorts of more or less conventional gas targets with different mixtures of gases.
- Users can also bring their own specific targets. In that case CLPU will provide the technical information and the user will be responsible of the adaptation of the target system in the experimental chamber.

Detection and measurement systems:

- The center has basic detection equipment for transport and detection of radiation and particle beams. A detailed list of available equipment will appear in the application form.
- CLPU team will try to facilitate the adaptation of the detection equipment that users may bring in addition.
- In addition, the center has characterization equipment in the laser area: temporaral (wizzler, sequoia), wavefront (Phasics), autocorrelator, energy meters, spectrometer, spatial profile analysis chamber, oscilloscopes, photodiodes.

Vacuum:

- Due to the requirements of the CPA compressors, VEGA operation requires a high vacuum level (10^{-6} mbar) and with very strict cleanliness requirements, so as to avoid chemical contamination (especially from hydrocarbons). Any equipment that the users may install must comply with these requirements. The CLPU will provide with the necessary vacuum elements and will perform the validation of the given elements that may pose a problem.

Other services:

- The center has a mechanical workshop where elements required for each experimental campaign may be made. This service will take care of the adaptation of the experimental items to the CLPU equipment (adaptors, flanges, feedthroughs, …) provided that the user gives detailed information (complete CAD models) at least three months in advance of the experiment.
- The center has a SEM microscope, and a conventional optical microscope.
- The center has other lasers with lower peak power (in the GW range).

Safety:

- The target area is a bunker that complies with the IRA 3254 (Radioactive Authorized Facility) authorized by the Spanish Nuclear Safety Council (CSN). The center has the control elements necessary so as to guarantee the safety in this respect. The license covers experiments involving high-energy photons, electrons, protons and other heavier ions. This initial call excludes experiments involving a significant number of neutrons or unstable isotopes. When appropriate (when users are given the role of Target Area Operator) external users will bring their own personal passive dosimeter, according to CLPU radiological safety regulations.
- Laser safety and personal protection gear (essentially goggles) will be provided.
- The center will provide users with training related to safety, and may request proof of their previous laser safety experience when proved necessary.

Human resources:

- The center has a highly-specialized scientific and technical staff. Users will exclusively work in the target area or its control area, never in the laser room. The laser will only be operated by specialized personnel of the CLPU. The parameters of the laser will be previously discussed with the laser personnel.
- A wide array of users is considered, ranging from those highly specialized (credited as Target Area Operator) that will work under the supervision of a scientist of the center, to collaborators that will need a scientific support team. Exceptionally, and as long as it has been previously discussed and coordinated with the personnel of the CLPU, it is also possible to develop experimental sessions remotely, without the presence of any external scientist.
- The center will also provide information and logistical support to the users. The travel and living expenses must be borne by the users.
- The personnel of the center will be responsible for the safety training of the users, issuing the appropriate permissions to each depending on their previous training as well as that received in the center.

Funding:

- The existence of funding for the development of the experimental campaign must be demonstrated. Otherwise, and exceptionally during this call, you may apply for an exemption of the access fees that will only cover for the time of use of the VEGA laser system beam, the use of the existing scientific and technological equipment and the support human resources for science, technology and logistics. When the experiment requires complex adaptations, additional consumables, etc., this will have to be previously discussed with the center. Also, and upon previous discussion, there is the possibility of in kind contributions.

4 Deadline for the submission of the proposal

The term for the submission of the proposals will start on the **15th of April, 2018** and will be open during the rest of the year. The first rating and allocation of beam time will include the proposals submitted before the **30th of June, 2018**. If the offered beam time quota is met before the end of the year, the call will be closed.

The **Local Coordinator** (Experiment supervisor) that acts as liaison between applicants and the center for this campaign is **Professor Luca Volpe (vegaservice@clpu.es)**. It is advisable to contact the Local Coordinator before submitting the proposal so as to check the feasibility of the development of the proposal in the CLPU and for the user to receive orientation about the submission, if necessary. These types of experiments are very complex and have very varied characteristics, so such a discussion prior to submission of a proposal is very important to optimizing the feasibility of the proposals.

5 Access period

The experimental proposals received during this call will be executed in the access cycle[2] that ranges **from February 2019 to December 2019**, tentatively.

In this call a tentative number of 75 experimental sessions is offered[3]. The distribution in terms of one arm or the other of VEGA is in the hands of the Access Committee to scientifically optimize the use of these resources. It is expected that the experiments of VEGA-2 and VEGA-3 will last several weeks, while the secondary sources experiments will last one or two working days. Tentatively 45 of those sessions will correspond to VEGA-2 (including the option with secondary sources) and 30 of them to VEGA-3.

6 How to submit the proposal and documents to be furnished[4]

The applicants as well as any researcher that may participate in the experiment will have to **sign up in the Facility Access Request On-line (FARO) system** that may be accessed by users in the website of the CLPU (www.clpu.es).

The researcher in charge or submitting the proposal will have to complete the **access request form** that is found in the FARO application.

It is possible to submit more than one proposal to the same or different phases.

[2] *Access Cycle: period of access covered by each call*

[3] *Experimental Sessions (or Shifts): one session equals 1 work shift (the number of laser hours per shift will be not less than five).*

[4] *All the information submitted by the applicants will be firstly reviewed by the Local Coordinator, who will check that the information submitted by the users is complete and is sufficient for both the Internal Committee as well as the Access Committee to perform their respective evaluations.*

Additionally, the following documents will be submitted:

- Accreditation of experience of the participants.
- Any other requested documentation for the correct evaluation of the proposal.

7 Evaluation boards and access criteria

All proposals will be firstly reviewed by the **Internal Committee** (formed by scientific and technical personnel of the CLPU). The Internal Committee will check if the development of the experimental proposal is feasible in the center, taking into account the following criteria:

- Technical feasibility
- Resource availability
- Safety and radiological protection aspects associated to the experiment

Then, the **Access Committee** will evaluate the scientific and technical quality of the experiment and will organize the distribution of beam time and the order of the experiments so that the resources of the Center are optimized. This board is formed by a minimum of five members, where two are staff or adjoin to the CLPU (scientific and technical personnel) and three external members in order to ensure the impartiality of the assignment of beam time.

The criteria for selection followed by the Access Committee and their percentage on the final score are the following:

GENERAL EVALUATION CRITERIA

Quality and originality of the project & research plan	**45 %**
Scientific-technical relevance in comparison to other applications received Innovative & relevant objectives in comparison to the state-of-the-art knowledge Planning, experimental arrangements & working plan adequate to the project objectives	
Researchers & collaborators scientific or academic excellence	**20 %**
IP & research team capacity to carry out the programmed activities Previous results & recent contributions of the research team to the project field	
Potential Impact	**10 %**
Contribution to the scientific community Social, economic or industrial importance of expected results Chances of exploitation of results (intellectual property, patents)	
Talent Promotion	**10 %**
Young researchers involvement First access to the CLPU of team researchers	

SPECIFIC EVALUATION CRITERIA	**15 %**
Criterion 1 Transfer of knowledge to the CLPU	5%
Criterion 2 Exceptional results in previous campaigns	5 %
Criterion 3 Exploitation of VEGA unique features	5 %

If during the evaluation of the proposals by the Access Committee any question that cannot be settled by this committee due to its scientific level arises, the question will be transferred to the Scientific and Technical Advisory Committee of the CLPU.

The Access Committee will assign a tentative order of precedence to the proposals, recommending a number of experimental sessions. Proposals that have already been evaluated and financed by external institutions will be given priority, as long as the Access Committee deems their scientific interest proven as compared to other evaluated proposals.

The Access Committee will propose to the Director a reasoned and prioritized ranking of applications, based on their scientific and technical quality. The Director will decide the final list of authorized accesses.

8 Notification of Evaluation Results

Applicants will receive via email the final result of the evaluation of their experimental proposal, including its ranking and the number of experimental sessions awarded, if any. Applicants whose proposals are approved will have to confirm their acceptance within 15 days after the notification is sent.

If the confirmation by the applicant does not meet the deadline, the experimental sessions will be assigned to a different proposal from the waiting list.

The Resolution (notification of results) by the Director of the CLPU, shall be issued within a maximum period of six months from the submission of the online applications, and will divide the scientific proposals in the following categories:

- A (Approved)
- B (Waiting List)
- C (Not approved)
- D (Nonviable)

The sum of all recommended sessions in the A (Approved) applications must be equal or less than the number of offered experimental sessions. The final decision with the lists (approved, waiting list, not approved and nonviable applications) and their ranking will be published in the website of the CLPU, maintaining the confidentiality of the applicants and sensitive information. As for the applications ranked as B, since they are considered of high scientific interest, the center will study the reasons why they were not approved and may make recommendations to the applicant so that the proposal may be submitted again in the next call for access.

An appeal for reconsideration against the resolution to the Director of the CLPU may be lodged within a month from the issuance of the Resolution. Also, a contentious administrative appeal may be lodged against the resolution before the contentious administrative court of Salamanca, within 2 months of the issuance of the Resolution. If an appeal for reconsideration against the resolution is lodged, it will not be possible to lodge a contentious administrative appeal until the appeal for reconsideration is resolved, or dismissed.

9 Documentation and Training before accessing the CLPU.

Before the beginning of the experimental campaign, those team members that will participate in the experiments, will have to provide the following documentation:

- Authorizations of the institutions of provenance for all the participants in the experiment.
- Proof of insurance through liability and accident insurance during the stay in the CLPU.
- Medical fitness certificate issued in the last twelve months indicating fitness to participate in the experiments on a form provided by CLPU.
- Also, they must complete and pass the safety training required by the CLPU.

10 Acceptance of the conditions by the admitted researchers.

All the researchers that will participate in the approved experimental campaigns are required to agree to the following commitments to:

- Fill in the quality of service questionnaire at the end of the service.
- Submit a report about the experiment developed once it has finished, within an agreed deadline. In the report, the number assigned to the proposal will appear.
- Acknowledge the participation of the CLPU in the results, co-authorship or use of the facilities of the CLPU, as the case may be.
- Communicate the publications derived by the works developed in the CLPU.
- Authorize the CLPU to publish the subject of their research. You could be asked for additional information (e.g. images, graphics, presentations, etc.) so as to disseminate the results of the experiment (e.g. annual report, newsletter, web, etc.).
- In the cases of projects funded by external institutions that require the completion of a signed satisfaction form, which confirms that the experiments have been developed in the facilities of the CLPU, submit a copy to the Center.

Failing to comply with the acquired commitments may comprise the possibility of presenting new scientific proposals for the access to the different services offered by the CLPU for a period of two years.

Salamanca, 13th April, 2018

Firmado por 37268360B LUIS ROSO (R: S3700007B) el día 13/04/2018 con un certificado emitido por AC Representación

Luis Roso

Director