

Application Form

Selection: 2019

KA2 – Cooperation for innovation and the exchange of good practices – Capacity Building in the field of Higher Education

Call for Proposals 2019 - EAC/A03/2018

Latin American Alliance for Capacity building in Advanced Physics / LA-CoNGA Physics

DETAILED DESCRIPTION OF THE PROJECT

JOINT PROJECTS

(To be attached to the e-Form)

PART D – Relevance of the Project

D.1 Why does the consortium undertake this project?

- Which problem(s) will the project address in the participating Partner Countries? Why are these problems pressing?
- Please explain the result of the need analysis carried out for each Partner Country and for each Partner institution and provide qualitative and quantitative evidence for your results. Please refer also to studies carried out and feasibility analyses undertaken. In particular explain for each institution, why the support from the CBHE action is required. (limit 10.000 characters)

The **primary objective** of the Latin-american Alliance for Capacity building in Advanced Physics (LA-CoNGA Physics) proposal is to modernize the educational platform in eight Latin-American higher education institutions (HEI) from four countries in the Andean region (Colombia, Ecuador, Peru, and Venezuela), using high-energy physics (HEP) as a model. The aimed modernization relies strongly on the development of an innovative e-learning platform based on low-cost open-access tools, installing connected instrumentation laboratories, a flexible problem-solving-oriented syllabus structured on modules for a one year master program and on the strengthening of cross-institutional relations among the target HEI's.

We propose to build capacity in the Andean region by teaching advanced physics during a one year master/specialisation and creating a Virtual Research and Learning Community (VRLC), complemented by training opportunities at 3 leading European research centers, start-ups and technology companies in the Andes and Europe and support to career development from the US. We leverage existing networks in international and regional HEP research.

Why HEP? HEP is the science of understanding the smallest components of matter and the origin of the universe, looking for answers to the key questions of our age: the existence of new symmetries at high energy, the nature of dark matter, the existence of extra space dimensions; the origin of Ultra High Energy cosmic rays. Big, precise, impressive machines and detectors are needed to achieve the goals of HEP. They are based on breakthrough technologies with the potential to contribute to the future competitiveness in key areas like healthcare, big data, electronics, open-access collaborative tools, etc. and open solid ground for young innovative companies and entrepreneurs. The main research areas in HEP currently cover: data acquisition and big data analysis, simulation and modelling, electronics and particle detectors and accelerators technology.

Problem: HEI's in the Andean region already have a high level of talent and brilliant teachers. However they cannot compete with the opportunities of large research universities, which used latest digital education tools and are closely linked to hands-on experimental facilities and a network of companies, as found elsewhere.

Observations:

(1) HEP has created vast virtual networks over more than half a century. The giant experimental facilities in HEP are shared and used remotely (like DESY in Germany and CERN with its Large Hadron Collider, LHC, at the border between France and Switzerland), and researchers collaborate globally on theoretical problems. HEP has been at the forefront of leveraging technology to solve research problems.

(2) The partner countries HEIs have connection to HEP. Efforts in the target HEI's within the HEP field started in the early 2000s by joining large experimental collaborations at the LHC or other regional astroparticle collaborations as the Pierre Auger Observatory (PAO) and the Latin-American Giant Observatory (LAGO). The consolidation of these efforts has proven difficult given the fragmentation of the Latin-american scientific community, episodic funding and subcritical mass in HEP-trained human resources.

(3) In the past, voluntary crowdfunded efforts have been set up to have remote teaching of HEP in some of these HEI from researchers/professors at the beneficiary, i.e. the CEVALE2VE (Centro Virtual de Altos Estudios de Altas Energías in Spanish).

(4) In the current information age, higher education is becoming globally distributed and inseparable from actual research and development in enterprises and companies. VRLC have proven to be an effective scheme in HEIs due to their possibilities for multi-institutional participation, synchronous and asynchronous online engagement, decentralised student discussion, academic networking, and cost-effectiveness. This type of cooperative lecturing arrangements exposes students and academic staff to a variety of cutting-edge concepts and techniques that cannot be accessed from just using standard textbooks.

Opportunity: one can create a VRLC by leveraging networks which already exist (CEVALE2VE¹, LatAm-EU-CERN², RedCLARA³) and new, inexpensive, online teaching technology. LA-CoNGA proposes to create a VRLC for HEP. These new online teaching technology will be made available to the whole partner country HEIs community to be used in other fields too.

Studies carried out and feasibility analyses undertaken: Since 2014 we have carried out small scale studies and feasibility analyses through the VRLC CEVALE2VE. CEVALE2VE has officially included a 60 hour virtual course “Introduction to HEP” developed for master and Ph.D. students in several of the partner countries HEIs: UCV and USB in Venezuela, UIS and UAN in Colombia, and UNMSM in Peru. The outcomes are invaluable: since 2014 the course has had four editions with more than 70 students joining from institutions in these countries. Many of these students have continued to a career in HEP now. The main challenges this crowdfunded network have faced are related to the need for a dedicated e-learning platform, the fragile IT infrastructure and non reliable broadband connections in the Venezuelan institutions and the fact that this preliminary initiative has relied on the brave goodwill of individuals. We will build upon our experience obtained with this virtual course of CEVALE2VE and address these challenges in LA-CoNGA Physics.

Need analysis results: While each partner countries HEI has various specific requirements to be addressed, there are significant similarities in their main needs that have been identified in the process of preparing this proposal. As a general rule, none of the partner countries HEIs possess a sufficient infrastructure for implementing e-learning tools on their own. Therefore inhibits the possibility of offering this kind of training through VRLCs. On the other hand, even if all universities support the formulation of new, modern physics programmes, focused on modern techniques and the needs of the modern world (like it is the case of HEP), all the physics departments in the partner countries HEIs have few academic staff specialized in HEP, insufficient to develop a complete Master-level set of courses on their own, and therefore unable to create opportunities for student careers traditionally connected to fields as data science, advanced electronics and instrumentation, and global networking. This project intends to use existing scientific networks in the region and across Latin America and Europe to instead create a critical mass across the region.

Also, the physics education at all partner countries HEIs includes an undergraduate five years program, a two years master degree program and a Doctorate program. It has been recognized lately the necessity of a shorter, more flexible scheme to allow students to choose earlier their career options. There are ongoing discussions on how to modify the programs in the lines

¹ CEVALE2VE: <http://www.cevale2ve.org/>

² LatAm-EU-CERN:

<https://international-relations.web.cern.ch/stakeholder-relations/Associate-Non-Member-State-Relations>

³ RedCLARA <https://www.redclara.net>

suggested by European Union (UE)'s Bologna declaration, but there still have been no agreement on this direction. Experiences with successful flexible master programs like the one proposed by LA-CoNGA Physics may help to boost this transformation. Below a detailed description of the additional needs for each partner countries HEI is provided:

Other specific problems and needs identified at the level of the Partner Country, Colombia:

Partner institution [Universidad Industrial de Santander (UIS)]: The UIS master degree is more than 50 years old and has a syllabus focused on traditional teaching methods and traditional theoretical physics contents with minimal training in data analytics or scientific instrumentation. Optics and Condensed Matter had been the most critical areas of the School during these years, with no expertise in HEP. Recently, Cosmology, Relativistic, and High Energy Astrophysics have emerged as critical areas of research with a significant number of students. Notably, the participation in two international collaborations related to Cosmic Ray Astrophysics: the LAGO and the PAO has boosted our experience in instrumentation of particle detectors. This program, open the possibility to train our students in HEP and complement our experience building particle detectors.

Partner institution [Universidad Antonio Nariño (UAN)]: Although the UAN has been member of large HEP collaborations since 2007, in particular the ATLAS experiment at the LHC and is now also part of the DUNE neutrino experiment (to be built between Fermilab in Batavia and South Dakota in US), it is a young university with not a strong tradition in Physics. The lack of state of the art instrumentation and data analysis tools discourage students interested in working on HEP. LA-CoNGA Physics would serve as a bridge between the Master's programme at the UAN and the research groups working on particle physics experiments.

Other specific problems and needs identified at the level of the Partner Country, Venezuela

Partner institution [Universidad Simón Bolívar (USB) and Universidad Central de Venezuela (UCV)]: These two universities face similar challenges. In recent years due to the economic and humanitarian crisis in Venezuela, there has been a decline in the number of teachers and researchers in Venezuelan HEIs. Therefore, many areas of scientific and technological importance which experienced a fast development are not adequately covered in their programs. This is the case with HEP-related topics, particularly instrumentation in detection techniques and data analysis in particle physics, which will be covered by the activities of this project. The e-learning platform and remote interactive teaching as part of the VRLC will be important to mitigate the shortage of professors at the universities. Furthermore, in the last years, the infrastructure has deteriorated considerably for lack of both maintenance and renewal of facilities. The scarcity of funds also impedes to support students through international internships.

Other specific problems and needs identified at the level of the Partner Country, Ecuador:

Partner institution [Universidad Yachay Tech]: Yachay Tech is a very young University that projects itself as a Research University (first in Ecuador) with a Faculty 100% Ph.D. By construction, they have focused on Condensed Matter Physics both experimental and theoretical, but recently they have also incorporated into their faculty personnel researching General Relativity, Nuclear Physics, Cosmology, and Quantum Optics. They have mandatory courses in the undergraduate curriculum that concerns particle physics and field theory taught by instructors with little research experience in the field. In September 2019 they plan to have a Ph.D. program that will include particle physics and field theory as one of its research directions, and they will need cooperation of the VRLC of LA-CoNGA Physics to guarantee quality and access to experienced teachers.

Partner institution Universidad [Universidad San Francisco de Quito (USFQ)]: USFQ is the only non-governmental higher education institution in Ecuador which offers an undergraduate Physics career since 1992. In 2018 a Master degree program in Physics was officially approved by the Ecuadorian government and will start at the end of 2019. A major disadvantage that a non-governmental higher education institution as USFQ faces is the impossibility to have access to government funding to invest in new teaching technologies and teaching lab facilities.

Other specific problems and needs identified at the level of the Partner Country: [Peru]:

Partner institution [Universidad Nacional de Ingeniería (UNI)]: the physics education at UNI requires a renewal of some of the installations (lab and computer facilities) and teaching methods in order to provide a cutting-edge training. Many of the students prefer to pursue his career in other institutions inside or outside of Peru with a more modern system. Also, UNI is lacking resources for student and staff mobility. The staff of the graduate programs consists in 20 academics (4 of them with a PhD degree, specializing in HEP) and the number of students is 24 (3 master students and 2 PhD students in HEP).

Partner institution [Universidad Nacional Mayor de San Marcos (UNMSM)]: The UNMSM is one of the most important higher education institutions in the country and, together with UNI, is the public institution most significant in Physics both for research and education standards. The needs for UNMSM are very similar to those of UNI to a large extent. With the addition that it does not possess a master program specialized in HEP at all. The participation of the UNMSM in the CEVALE2VE courses created interest at the university level to implement new and open learning tools to give access to the students to courses of cutting-edge fields like HEP.

(Please add Partner Countries/partners as appropriate)

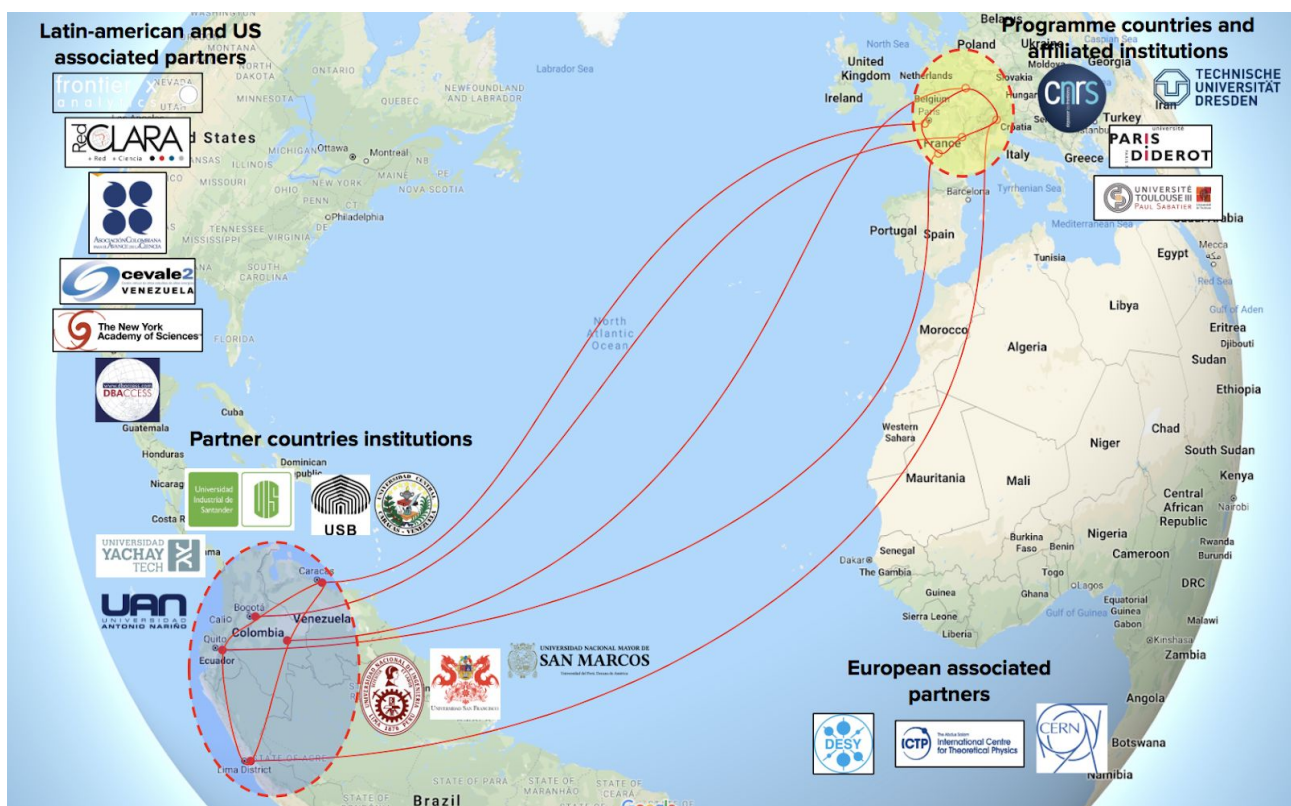


Figure 1. LA-CoNGA Physics network members

Please identify the target groups and their needs in each Partner Country and in each Partner Country institution. (limit 8.000 characters)

LA-CoNGA Physics will support technology-use and digital competence development in high energy education in 8 institutions from 4 Latin American countries. HEP community will be the initial use case. The target groups that are direct beneficiaries of the project are shared among the different partner countries HEIs given the character of the VRLC. A list of target groups have been identified as follows:

- **Teaching staff** refers to professors, researchers, and postdocs within the partner countries HEIs with relevant expertise in the teaching of HEP-related courses. Their primary needs are:

- to build an entire HEP program. In some cases staff number is small, they can't in reasonable time create it all;
- to develop/receive pedagogical and technical training skeme to use e-learning and open-access tools. 50% of the research community lacks open science skills including knowledge of citizen science and 3 out of 4 researchers have no training in open access or open data management;
- to design material and e-learning tools to implement the HEP program;
- to receive professional development training;
- to foster a long-term multidisciplinary network with colleagues in academia and industry both in Latin America and Europe.

- **Technical staff** refers to engineers and technicians in the physics departments of the partner countries HEIs. Their primary needs refer to technical training to use e-learning tools, open-access tools and open data as well as the connected instrumentation labs to be used in the project. This proposal will implement syllabus for the technical staff, to transform them from just working on technical side of research or education to become instructors on experimental techniques, in the connected instrumentation labs. Training of the technical staff in the partner countries HEIs will ensure the sustainability in a time of the project.

- **Administrative staff** assigned to teaching-related activities in the physics departments of the partner countries HEIs. This target group needs to acquire experience regarding the participation in large-scale collaboration educational projects, EU projects and the EU Bologna system for higher education. With this experience, this project will create opportunities for the administrative staff involved to manage other network programs that could emerge and benefit from each other experience. This will make the process sustainable after the end of the project and promote other similar experiences.

- **Program Students** participating in the two sessions of the one-year master-level program that will be developed during LA-CoNGA Physics. Their primary needs regard a high-level and cutting-edge training in HEP-related topics to gain the necessary technical background, domain knowledge and skills to follow a career path either on academia or industry; as well as to create a working network that can support them in their career. A high emphasis will be put on the acquisition of digital and data science skills, which are an extremely important part of HEP and also of the non-academic job market: 1 out of 5 young people does not have basic digital skills and 90% of all jobs require at least basic digital skills today. Coding fosters logical thinking, problem solving, and creativity.

- **Primary and secondary school students** participating in the outreach and citizen science activities. Recent studies show that fewer than a third of high school students exhibit science concepts and skills appropriate for their grade level and that motivation for scientific careers and topics are shallow. Mid- and high school students need to be engaged in a science-related topic with creative pedagogy and tools more responsive to children's attributes.

- **General public** participating in general outreach activities organized locally or globally by members of LA-CoNGA Physics. The general public needs to be in contact with higher

education teachers and scientists to value the importance of science in our everyday life and to tackle global issues in an evidence-based way.

Below you can find the list of the number of persons for each target group in each partner countries HEIs:

Partner Country: [Venezuela]:

- Partner institution [Universidad Central de Venezuela (UCV)] 4 teachers (after losing 50% of the staff since 2005), 2 administrative staff, 2 technical staff in the Physics Department, expecting 5-10 students per year at the master-level and at least 3 schools to participate.
- Partner institution [Universidad Simón Bolívar (USB)] 2 teachers, 2 administrative staff, 2 technical staff in the Physics Department, expecting 8-10 students per year at the master-level and at least 3 schools to participate.

Partner Country: [Colombia]:

- Partner institution [Universidad Industrial de Santander (UIS)] 2 teachers, 1 administrative staff, 2 technical staff in the Physics Department, expecting 6-8 students at the master level per year and three schools.
- Partner institution [Universidad Antonio Nariño (UAN)] 3 teaching staff, 1 technical staff, 1 administrative staff, expecting 4-6 master students per year and 3 local schools.

Partner Country: [Ecuador]:

- Partner institution [Universidad de Yachay]: 1 teacher staff, 1 administrative staff, 1 technical staff, expecting 8-10 master students per year and at least 3 schools to participate.
- Partner institution [Universidad San Francisco de Quito]: 2 teacher staff, 1 lab technician, 1 administrative staff, expecting 6-8 students per year and around 4 schools to participate.

Partner Country: [Peru]:

- Partner institution [Universidad Nacional de Ingeniería (UNI)]: 4 teaching staff, 2 technical staff, 1 administrative staff, expecting 8-10 students at the master level per year and at least 3 schools to participate.
- Partner institution [Universidad Nacional Mayor de San Marcos (UNMSM)]: 4 teaching staff, 2 Technical staff, 2 administrative staff, expecting 8-10 students at the master level and at least one local school to participate.

Note: In part C.7.1 the number of “HEIs’ administrative staff” corresponds to the sum of administrative and technical staff mentioned above. In part C.7.2 we estimated that the number of students primary and secondary schools as well as general public to participate in our outreach and citizen science is around 800.

(Please add partner countries/partners as appropriate)

How will the project address the relevant thematic national/regional priorities (see https://eacea.ec.europa.eu/erasmus-plus/funding/capacity-building-higher-education-2019_en) set by the Programme for its target country (ies)/region(s)? (limit 8.000 characters)

The proposal is a Joint Project within the theme **“Strengthening of relations between HEIs and the wider economic and social environment”** to be developed with eight targets HEIs in four Andean countries: Venezuela, Colombia, Ecuador, and Peru. LA-CoNGA Physics will use existing, innovative, proven, shelf-top technology for e-learning to deliver the VLRC and build capacity.

The regional priority this project is addressing is the following: **“New technologies in higher education”**. This regional priority is divided in several points:

- Support to the modernisation of Higher Education systems through the development of open educational resources. LA-CoNGA Physics will create an e-learning platform starting from the existing tools from RedCLARA and CEVALE2VE. RedCLARA is an international organization whose aim is to connect Latin America's academic computer networks. The LA-CoNGA Physics partner countries and their respective National Research and Education Networks are currently part of RedCLARA. One of the tools that RedCLARA has is the Colaboratorio⁴, an online platform specially developed to support the work of academic and scientific communities. To this end, it offers a wide range of services that enable communities to share and promote knowledge, organize joint activities, and communicate in real time, optimizing time and efforts in a private, secure environment for its users. LA-CoNGA Physics will develop new modules for the Colaboratorio based on the needs of the partner countries HEIs and the expertise from the CEVALE2VE experience, i.e. tools to access open data from big HEP collaborations⁵, live programming tools based on Jupyter notebooks⁶, tools for remote access to connected instrumentation labs across the partner countries HEIs. Such a working platform and tools have never been used in any of the partner countries HEIs and will be made available for the whole partner countries HEIs, contributing to its modernisation and accessibility.

- Support to the modernisation of Higher Education systems through connectivity. The connectivity will be part of the partner countries HEIs co-financing, partly ensured also through redCLARA. However LA-CoNGA activities will highlight the importance of a good connectivity in the development of educational digital projects and will help justifying the importance of a good connectivity.

- Support to the modernisation of Higher Education systems through the adquisicion of digital skills. Teachers and technical staff will acquire new digital skills to manage and create contents for the e-learning platform. The acquisition of new digital skills useful for economic changes is also an important part of the content of the one-year master program that will be developed within LA-CoNGA Physics. Therefore topic like coding, programming, machine learning and artificial intelligence (AI) will be part of the program.

- Support to the modernisation of Higher Education systems through the development of learning methods. The teaching methods will be updated to include the e-learning technologies and the use of the connected scientific instruments in the laboratories. The connected instrumentation laboratories will allow target groups from one HEI to access the scientific instruments installed in others partner countries HEIs and analyse their data.

- Support to the modernisation of Higher Education systems through the mobilisation of stakeholders including teachers, learners, economic and social partners. A mobility scheme is part of the LA-CoNGA Physics proposal. Students will do internships in academic and/or non-academic institutions in Europe and/or in the Latin American partner countries. Mobilisation of teachers is also considered through the consortium meetings and network schools (see Part E for more information).

HEP is the perfect candidate to test this environment since it is a crucial sector of knowledge and technology that touches important areas like healthcare, big data, electronics, etc., creating in this way strong relationships between the HEIs and the broader economic and social environment in the regions. Once tested within the HEP VRLC, the open educational e-learning platform will be made available for all members of the partner countries HEIs to be used in other fields. This will be done through one of our associated partners, RedCLARA.

⁴ RedCLARA Colaboratorio:

<https://www.redclara.net/index.php/en/servicios-rc/servicios-de-colaboracion/comunidades-colaboratorio>

⁵ CERN Open Data Portal: <http://opendata.cern.ch/>

⁶ Jupyter notebook: <https://jupyter.org/>

(Please add Partner Countries/regions as appropriate)

D.2 Aims and objectives

- What does the proposal aim at in general? What are the project's specific objectives?
- Explain how the specific objectives of the project address the problems mentioned in Part D1 and the needs of each target group in each Partner Country. Demonstrate also that the set objectives are realistic and feasible in the national and institutional context(s).

(limit 8.000 characters)

We are currently evolving from a long-running industrial age to a more sophisticated information-based economy. In this transition, we would expect the traditional educational models to overhaul to fit the growing demands of collaborative knowledge generation and the new profiles of the informational entrepreneurs driving economic and social changes. University education, in particular, is becoming distributed, globally social and inseparable from the actual research enterprise, i.e., knowledge generation, deployment, application, and transfer are taking place in the same physical and social context; furthermore, distributed learning mainly relies on community interactions and cognitive tools⁷.

The general aim of the LA-CoNGA-Physics project is to bring this transition to eight Latin-American targets higher education institutions from the Andean region (Colombia, Ecuador, Peru and Venezuela) participating in the project.

The specific goals that derive from the project are:

- Support the modernization, accessibility to knowledge and internationalisation of higher education in the partner countries HEIs based on the integrations, installation, and training for innovative e-learning platform and open-access tools (Softwares, contents and Data). We will build virtual research and learning community for High-energy physics based on our previous CEVALE2VE --scaled-- experience.
- Strengthen inter-institutional relations among the target HEI's and with partner institutions in Europe through interactions within the virtual research and learning community
- Promote convergence in the curricular offering in HEP in the HEIs and close cooperation in the academic activities trying to match the EU Bologna model.

The network will attain its goals through SMART (Specific, Measurable, Assignable, Realistic, Timed) Objectives, explicitly targeting implementation, training, and educational activities:

SMART implementation objectives:

- Integrate an educational platform (e-learning tools, website, discussion forum applications) from proven settings, developing some extension --in data handling and remote instrumentation-- to the existing environment in RedCLARA and CEVALE2VE.
- Update training facilities at partnering HEIs to fulfill the requirements of the new curricula, e.g., adapt local spaces at the partner countries HEIs to give access to the local staff and students to the e-learning tools and also create local spaces with data acquisition and electronics material for small HEP experiments and practices for students and citizen science projects.

SMART educational objective:

⁷ Swan, K., & Shea, P. (2005). The Development of Virtual Learning Communities. In: S. R. Hiltz, & R. Goldman (Eds.), *Asynchronous Learning Networks: The Research Frontier* (pp. 239-260). New York, NY: Hampton Press.

- Develop the curricula for the online courses for a one-year master/specialization on HEP that will be shared among the different HEIs. Summing up the combined academic body of the eight target HEIs and EU universities, with the support of a team of associated partners (academic & industrial) will cover a broader spectrum of expertise to build this currently inexistent master program.

SMART training objectives:

- Train technical and academic staff, as well as students target groups. Technical and academic staff will master the e-learning tools and collaborative environment in their HEIs, and appropriate academic staff will learn new pedagogical resources and methodologies that can be used and transmitted to other fields in their HEIs. The program students will benefit from transversal skills that go from instrumentation to modern data analysis techniques, as well as elemental entrepreneurship skills. Primary and secondary students (STEM Talent Pipeline) will be exposed to the most challenging fields of scientific research through citizen science projects.
- Enable the careers of the academic staff and students target groups through the program and beyond. Students will also develop skills, relevant to pursue a career in the collaborative field whether in academia or industry. They will have ample experience, through possible secondments/internships, in academic partners and non-academic associated partners in the project in Latin America or Europe. Mobilisation of teachers is also considered through the consortium meetings and network schools. Working in a VRLC will offer them the experience of working in different environments and with different approaches.

As you can see the SMART objectives address the needs described in part D.1. They address the needs: the creation of an open e-learning platform and the adquisition of digital skills to create digital content; the creation of the VRLC for inter-institutional collaboration sharing teachers and connected instrumentation labs will allow to have a critical and expert mass in HEP education; the development of scientific instrumentation and open platform data acquisition systems (DAQ); acquisition of theoretical and practical knowledge of modern data analysis; expertise in use of computer packages for simulations and real data analysis and the convergence in the curricular toward the EU Bologna model.

The objectives are specific; measurable by the project deliverables (see Part E.6). They are assignable as each WP will have clear responsables. The task distribution is within the capacities of the contributing organizations. Each partner will commit qualified human resources in order to contribute experienced teachers and students to the activities. They are realistic because it is based on previous experiences (i.e CEVALE2VE), addresses clearly identified common needs among partners countries HEIs and rely on pre-existing connections between partner HEIs and programme HEIs as well as between partner HEIs; and finally timed by activities (see Part E.5)

All the necessary resources (specialized equipment, infrastructure, and personnel) to carry out this research training project are already available or budgeted for at the premises of the partners or the associated partners. Private industries are involved in the project via the existing partner's collaborations: the e-learning platform will be built by expanding the tools available in the Colaboratorio platform from RedCLARA --the trusted and open technology, that will be extended to handle data and remote instrumentation-- and based on the experience acquired by CEVALE2VE. Other industrial associated partners, like DBAccess and FrontiersX, will provide students internships. Internships for students and short visits for academic staff will also be allocated (the labs have committed to host and supervise the students, so that the investment of the project is maximize) in the project and implemented through the associated academic partners --world-recognized international research centers like DESY, ICTP, CERN, IRFU--

In a more global scale, there are several resources and guidelines regarding digital education. To be up-to-date LA-CoNGA Physics will closely follow the developments of the Digital Education Action Plan adopted by the EU to support technology-use and digital competence development in education. It is also important to notice that LA-CoNGA Physics will contribute to two of 17 Sustainable Development Goals (SDGs) that the United Nations (UN) adopted for the 2030 agenda. LA-CoNGA will encourage innovation and increasing the number of research and development workers in particular developing countries which is one of the targets of SDG 9 (Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation). Also, LA-CoNGA Physics will provide equal access education; will provide scholarships available to developing countries for information and communications technology, technical, engineering and scientific programmes and will substantially increase the supply of qualified teachers, including through international cooperation for teacher training in developing countries which are targets of SDG4 (Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all).

(Please add Partner Countries/regions as appropriate)

Please explain how the planned activities and the expected results meet the needs of the identified target groups in the Partner Countries (limit 6.000 characters)

The identified target groups are common to all partner countries HEIs and to a great extension their needs are common too. We have identified the following target groups: teaching staff, technical staff, administrative staff, university students, primary and secondary school students and general public.

The creation of the e-learning platform and the corresponding training will meet the needs of the teachers and technical staff for pedagogical and technical training skeme to use e-learning and open-access tools. Creation of lab facilities dedicated to an specific aspect of particle detection techniques will accelerate the growth of knowledge and expertise needed for several projects which is important for the teachers staff: for example UIS is very interested in develop astroparticle detectors based on Silicon photomultipliers (SiPM) for muon tomography of volcanoes; UAN is involved in the upgrade for the ATLAS detector and also in the development of the DUNE detector, opening a wide range of opportunities for students to take part in several activities, provided the appropriate equipment is available; USFQ is very interested in develop astroparticle detectors based on Resistive Plate Chambers (RPC) gaps for Space weather and HEP applications, initial tasks and training has been done in collaboration with researchers from ATLAS. The creation of a lab facility dedicated to basic instrumentation will also serve as an incubator for short projects and thesis for students in the master program (primarily) and in the undergraduate level (gradually/eventually) both on-site and online and they can be used for citizen science projects and open days at the partner countries HEIs for primary and secondary school students and general public.

This proposal will implement syllabus for the technical staff, to transform them from just working on technical side of research or education to become instructors on experimental techniques, in the connected instrumentation labs. The will be trained to install, setup, calibrate and use those connected instrumentation laboratories. Training of the technical staff in the HEIs will ensure the sustainability of the project. USFQ, UIS and UCV have already experience with instrumentation and will support the training of the other partner countries HEIs together with CAEN, one of the main instrumentation companies providing a scientific instruments which meet IEEE⁸ Standards for Nuclear and Particle Physics and one of our associated partners.

⁸ IEEE: <https://www.ieee.org/>

The academic level of the universities will greatly increase with the HEP one-year master/specialisation program offering advanced courses and training at the research frontier. Teacher staff will profit from the VRLC created to develop and give the courses. In many cases staff number is small, they can't in reasonable time create it all. Other programs, e.g. in Medical Physics and Computer Science, will also profit from the initiative.

Students and professors will have an unique opportunity to interact with their fellows in Latin America and experts in Europe helping to a rapid internationalization of the university with the strengthening of the present collaborations and the creation of new ones. Furthermore, the acquisition of expertise in modern data analysis tools not only will increase the knowledge of the master students in HEP (the computer facilities of the department will get better too), also the infrastructure (physical and virtual) will serve as a help for other programs or departments present in the partner HEIs. For example it is important to use advanced alternative data analysis techniques to tackle problems in areas like Agriculture, Climate, Medicine, Finance, etc but currently there is a lack of experts to handle these problems. The links with the industry (several applications of the modern data analysis expertise) are also important because we need to dedicate efforts to ensure sustained development of the graduate programs in general, a very important fact sometimes missing in the elaboration of curricula in developing countries in the Latin-American region. The needs will be cover with the outcomes of this project, seeking to have both academia and industry internships for our students.

Regarding the administrative staff, this project will create opportunities for them to get to manage large scale collaboration educational projects, EU projects and the EU Bologna system for higher education that they can use for other projects at the partner countries HEIs. A complete set of training modules on critical professional skills will be addressed by a coherent program crafted and delivered by the New York Academy of Sciences (NYAS) and the Colombian Association for the Advancement of Science (ACAC). This will help the members of LA-CoNGA Physics to navigate career relevant decision processes and access to continuous professional development. Lastly, an important part of the project is related with the dissemination of the results of the project and the importance of HEP, its applications, physics and science in general through outreach activities that will target primary and secondary schools as well as the general public.

(Please add Partner Countries as appropriate)

How will the project and its results contribute effectively to the objectives of the action Capacity-Building in the Field of Higher Education in each targeted Partner Country? (limit 6.000 characters)

As mentioned previously, there are many commonalities regarding the needs of the partner countries HEIs but also on the objectives, activities to be held and results expected in the framework of the LA-CoNGA Physics project. Effectively all partner countries HEIs will work as a single unity, a VRLC. Therefore we present the common aspects of how the project and its results contribute effectively to the objectives of the action CBHE, including when relevant specific examples for each partner country.

Capacity-building projects aim to:

This project contributes effectively in the following way:

<p>Support the modernisation, accessibility and internationalisation of higher education in the eligible Partner Countries;</p>	<p>The extension, integration and implementation of the e-learning platform and local IT and instrumentation laboratories for the courses will contribute to the modernization of the HEIs and their transition to the e-learning educative phase. The use of modern connected instrumentation laboratories is important for all HEIs but it is crucial for the young universities like Yachay Tech and UAN; for the USFQ which as a non-governmental institution has problems to have access to government funding to invest in new teaching technologies and teaching lab facilities and for the Venezuelan HEIs. At the moment, Higher Education in Venezuela is enduring difficult conditions for academic and scientific activities. The LA-CoNGA Physics project will have a positive impact in the field in helping local programs to keep going while preparing to rebuild capabilities in the future.</p> <p>Eight HEIs conform the team in the project in Latin-America, three HEIs in Europe, four world-recognized research institutions CERN, ICTP, DESY and IRFU, three private companies and three non-for profit organisations. Clearly, the internationalization will be established in two levels: from the intra-regional links among the HEIs in Latin America and with the European institutions.</p>
<p>Support eligible Partner Countries to address the challenges facing their higher education institutions and systems, including those of quality, relevance, equity of access, planning, delivery, management and governance;</p>	<p>With the e-learning based HEP one-year master program and its mobility scheme in HEP, the students will be exposed to cutting-edge experimental infrastructures and a variety of concepts and techniques not found in standard textbooks, science that is happening now! The HEP master program from this VRLC is important for all HEIs but it is crucial for universities that are starting to work in HEP as Yachay Tech and UNMSM.</p> <p>LA-CoNGA Physics initiative will train younger generations by research performed at the most advanced facilities in the two continents. The tools and laboratories will be available for the university community as a whole and training sessions will be organised for local staff such as they can also be used in other fields of study within the HEIs.</p> <p>HEP being a very capital intensive and complex science, it has two interesting aspects: to train people you need labs, and staff, and courses, and access to international research centers. This is not available fully in the region but can become available thanks to LA-CoNGA Physics. This is about quality and equity of access. Also, those trained in HEP learn things as advanced electronics and data science which are the blocks of the new economic</p>

	<p>growth, and therefore LA-CoNGA Physics will create further access.</p> <p>HEP is governed by consensus and in a very participative way. Experiments have boards with all the countries and institutions. The field fixes regional objectives as a whole. By exposing the HEIs to this project, that will be governed in a similar way, we will introduce good governance in a multilateral and international setting.</p>
Contribute to cooperation between the EU and the eligible Partner Countries (and amongst the eligible Partner Countries);	<p>The virtual research and learning community (VRLC) in HEP will consolidate and strengthen the collaboration at the educative and also research level between its members, building on the experience acquired during the last years within CEVALE2VE.</p> <p>The teachers staff and students from Latin America will visit the host institutions in Europe and vice versa, as well as visits between the partner countries in Latin-America, encouraging mobility and internationalisation.</p> <p>We will bind together: the creation of content, the deliver of the course, the acceptance of internships at the institutes in Latin America and in EU. There is a real need in the Latin American HEP community which is too small to cooperate in order to create the 'talent pipeline' and start teaching this discipline. Without this project this won't be possible (not enough local resources, not enough structure) and by doing the project we can deliver on a long-term shared objective (growing the community).</p>
Promote voluntary convergence with EU developments in higher education;	<p>The structure of the Curricula and the opportunities offered to students (e.g. instrumentation and IT practices at home and internship) will naturally mimic the structure used in EU universities where the participants to the projects work. Also, the working practices in EU in the field at the edge of research and education is what LA-CoNGA Physics will introduce as it is starting HEP education bottom up from scratch - these practices have been very successful in making EU a HEP powerhouse (e.g. the students first do practices at home, then get sent to labs to do theses)</p>

Promote people-to-people contacts, intercultural awareness and understanding.	<p>Utilizing video conferencing environments, it is practical in a VRCLC to develop face-to-face relationships to ensure teacher immediacy and student social presence to facilitate collaborative engagement. Moreover, this will be complemented by the international mobility scheme to promote the people-to-people contacts and the intercultural awareness and understanding.</p> <p>This proposal will apply the HEP view of shared objectives which transcend individual cultures and promote exchange, and this is clear in large multilateral research centers as CERN, IRFU and DESY for experiments and ICTP for theory.</p>
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How do the project's objectives fit in with the modernisation and internationalisation agenda of the targeted higher education institutions in the Partner Countries and with the development strategy for higher education in each Partner Country involved in the project? (limit 6.000 characters)

LA-CoNGA Physics objectives fit with the modernisation agenda of the targeted higher of the targeted HEIs in the partner countries since it involves: the use of new unique e-learning tools that will support the VRCLC activities; new instrumentation labs that will be made available remotely through the e-learning platform and a new teaching method though modular, flexible structures for the online courses. They also fit their internationalisation agenda thanks to the mobility scheme for students and the participation in the project of eight HEIs in Latin-America, three HEIs in Europe, four world-recognized research institutions CERN, ICTP, IRFU and DESY, three private companies and three non-for profit organisation. Clearly, the internationalization will be established in two levels: from the intra-regional links among the HEIs in Latin america and with the European institutions.

Partner Country [Colombia]:

This program will address two of the development strategies at the Physics Master programs in Colombia: rigid curriculum and only-academic-future after graduation. First, this proposal will have a modular, flexible structure (contrary to most common graduate Colombian programmes) and will give students the opportunity to learn techniques/tools beyond HEP. Although students should learn the basic of HEP research (theory, instrumentation and data handling), they will be able to tailor their training with elective courses and with the possibility to select an internship in IT companies in the target countries. The learning tools developed and the content of the courses will remain at the partner Institutions to further improve the existing Master's programmes and opening new possibilities for students.

Partner Country [Ecuador]:

In Ecuador the Physics graduate programs at USFQ and Yachay-Tech are trying to expand their academic offer in order to address the development of competencies and expertise in applied areas, and HEP is included there. Also these universities are trying to modernise their teaching system, which fits with our proposal of implementing modern e-learning technologies.

Partner Country [Peru]:

Recently in Perú the Government through an autonomous office called SUNEDU (Superintendencia Nacional de Educación Superior Universitaria, in Spanish) has implemented a procedure to validate and certificate all the universities in the country. Under these goals, LA-CoNGA Physics initiative represents a unique opportunity to increase the governmental and institutional support to projects relevant to cutting-edge physics in Peruvian HEIs because with

the execution of this project these institutions will be ranked high. Also, represents an alternative to the usual two-year master program available in the country; serving as a test, this one-year master program will show the advantages to adequacy into a program in the lines of the EU Bologna Model.

Partner Country [Venezuela]:

Similarly to the ecuadorian HEIs, the Physics graduate programs at UCV and USB in Venezuela are also trying to expand their academic offer in order to address the development of competencies and expertise in applied areas. The initiative will precisely allow students, as well as faculty, to acquire valuable knowledge in the newest techniques in HEP which have a broad range of applications. The programs in Venezuela are also seeking to integrate within an active international research community. They especially look forward to establishing fruitful collaborations with regional partners with whom they can also share educational resources.

Please explain how the proposal will pay attention to the issues of inclusion, diversity and socio-economically disadvantaged participants and/or organisations in the Partner Countries. (limit 2.000 characters)

Most of the partner countries HEIs are public institutions (except UAN and USFQ) in countries: --Venezuela, Colombia, Ecuador and Peru-- with students with a diverse socio-economic background, a part of which are low-income students. Equity of access will be ensure in three ways: first, the e-learning platform/ICT tools and instrumentation labs integrated to existing platform will be available for all members of the HEIs community. Second, all the content produced will be open, not limited to those participating students and finally LA-CoNGA Physics takes very seriously the importance of outreaching science and therefore includes outreach and citizen science in his work plan, delivering on students' initial training in electronics as well as STEM outreach in the local communities.

Concerning gender institutional gender policies in LA, the situation in Latin-America is different to the reality in North America and Europe: almost half of the Ph.D. degrees in Latin America are completed by women, and almost half of researchers are female. The universities are doing well in having a balanced students' body which completes education. What LA-CoNGA Physics will do is to give equal opportunities to both to receive a higher educations through the open project approach.

LA-CoNGA Physics Beneficiaries and Partners are committed to foster inclusion and diversity putting in action measures to actively counterbalance this inequality and empower women and minorities within the group to guarantee inclusion and diversity. Within the policies of each university to accept students, the project will be able to address including diversity in their activities. Two dedicated figures – the internal Equality, Diversity and Integration Officer (EO) and the External Advisory Committee (EAC)– will monitor that all decisions taken by the Executice Board (EB) and by the selection internship panels will follow anti-discriminatory and equal opportunity procedures. LA-CoNGA Physics will promote the presence of highly qualified women giving the courses courses and seminars to serve as role models for the students. LA-CoNGA Physics will officially adhere to the EU gender toolkit. All members of the group will receive specific training session on equality- and diversity-awareness.

D.3 Innovative character

Demonstrate why the proposal is innovative.

If it is complementary to previous/existing funded projects nationally or internationally please explain how the new proposal build on it/them and demonstrate its added value and why it is not a simple continuation thereof. (limit 2.000 characters)

LA-CoNGA Physics will create a Virtual Research and Learning Community where teachers, students and technicians from the different HEIs participating will work together effectively on an ICT infrastructure, where e-learning nano-modular courses, data, software tools, IT and instrumentation facilities and other information resources are seamlessly shared. Such a unique structure will be put in place for the first time in the region modernising in this way the university infrastructure and way of teaching, offered as a deliverable in the form of a one year master/specialization in HEP. The network will foster creativity, problem-solving skills, and independent thinking in its members through research in one of the most challenging and competitive fields of science, spanning the triangle of theoretical concepts, experimental realities, and practical applications of modern data analysis methodology.

A strong intersectoral component with a mobility scheme in academia, industry and start-ups environments will further engender a profound appreciation of different requirements and cultures in the academic, public and the private sector. Network-wide specific training activities will complement this project. To the best of our knowledge, no current existing funded project nationally or internationally provides access to such a diverse environment and possibilities are not available for the students and teachers at this point. LA-CoNGA Physics builds on the activities of the CEVALE2VE (Centro Virtual de Altos Estudios de Altas Energías in Spanish) group. The virtual graduate course 'Introduction to Particle Physics' has been the first CEVALE2VE academically formal project since previous activities of this virtual community were mainly concerned with science popularization and virtual visits to the CERN facilities. After four versions of the course with six institutions participating CEVALE2VE has gathered enough experience to expand and successfully tackle LA-CoNGA Physics.

One of the partner countries HEIs, UIS, has active participation in a collaborative experience to empower organized communities to produce, curate and disseminate environmental data. RACIMO (for its Spanish acronym of Red Ambiental Ciudadana de Monitoreo, i.e., Environmental Citizen Monitoring Network) is a network of low cost on shelf weather stations based on open hardware & software architecture which measures: pressure, temperature, humidity, precipitation, cloudiness, illuminance/irradiance, noise, CO₂ and NO₂. UIS has started this experience training students & teachers from seven mid-secondary schools through a syllabus of 12 two-hours lectures with web-based support which exposes them to basic concepts and practices of Citizen Science and Open Data Science. LA-CoNGA Physics will develop similar activities as RACIMO in the partner countries HEIs.

If the proposal builds on any previous or existing EU-funded/non-EU funded national or international activities/projects in this field, please fill the following table for each of these projects.

Reference number			
Project dates (year started and completed)	2014-Present	Programme or initiative	CEVALE2VE
Funded by	No official funding/ voluntary labors from its members		
Title of the project	Virtual graduate course 'Introduction to Particle Physics'		
Coordinating organisation	CEVALE2VE		

Partner Countries /institutions targeted by this project	Venezuela: <i>Universidad Central de Venezuela (UCV), the Universidad Simón Bolívar (USB), Universidad de Los Andes (ULA).</i> Colombia: <i>Universidad Industrial de Santander (UIS) and the Universidad Antonio Nariño (UAN)</i> Peru: <i>Universidad Nacional Mayor de San Marcos (UNMSM)</i>		
Website	http://www.cevale2ve.org		
Password / login if necessary for website			
(a) Summarise the project outcomes (b) Explain how ownership/copyright issues are to be dealt with (limit 2000 characters).			
<p>CEVALE2VE contributes to the scientific dissemination of fundamental physics and the implementation of modern education technologies at the university level. Its first academically formal project was the implementation of a six-months virtual graduate course 'Introduction to Particle Physics' with the support of an academic sponsor at each participating institution. This course, taught by postdoctoral researchers in academic institutions and research centers in North America and Europe gives an overview of a variety of techniques that are not found in textbooks, and which cannot be comprehensively covered at present in many regional universities. The outcomes are invaluable: since 2014 the course has had four editions with more than 70 students joining from institutions in Venezuela, Colombia, and Peru.</p>			

Please copy and paste tables as necessary

Reference number			
Project dates (year started and completed)		Programme or initiative	
Funded by	Fondo Regional para la Innovación Digital en América Latina y el Caribe (<u>Programa FRIDA</u>), the Vicerrectoría de Investigación of the UIS and developed by the Grupo Halley de Astronomía y Ciencias Aeroespaciales from the Physics School of the UIS.		
Title of the project	RACIMO (for its Spanish acronym of Red Ambiental Ciudadana de Monitoreo, i.e. Environmental Citizen Monitoring Network)		
Coordinating organisation	Universidad Industrial de Santander (UIS)		
Partner Countries /institutions targeted by this project	5 schools in Bucaramanga-Colombia		
Website	https://halley.uis.edu.co/tierra/?page_id=143		
Password / login if necessary for website			
(a) Summarise the project outcomes (b) Explain how ownership/copyright issues are to be dealt with (limit 2000 characters).			
<p>RACIMO is a collaborative experience to empower organized communities to take decisions on environmental data produced and curated by themselves, which is taking place at Bucaramanga-Colombia. The environmental network is built by low-cost Arduino-Raspberry-Pi weather station which measures pressure, temperature, humidity, precipitation, cloudiness, illuminance/irradiance, noise, CO2 and NO2. Because this project needs some essential</p>			

expertise in data production and handling, RACIMO initially focuses on students of mid secondary school which usually are 15 or 16 years old.

D.4 European added value

Why is there a need for cooperation with the Programme Countries in this area of activity and a funding via the Erasmus+ Programme? Why can the intended results not be achieved through national, regional or local funding in the Partner Countries? (limit 2.000 characters)

The goal of the project is to create a deeply connected network of academic institutions and industrial partners between European and Latin American countries in the form of a VRLC. We aim at providing to the different target groups the best possible resources available, both at an educational level as well as links to world leading research centers and companies. This will create in the long term invaluable partnerships between the two continents, opening opportunities for a diverse workforce in science, encourage emerging markets and strengthen the economic ties between local communities. Such far-reaching goals can only be attained via a close cooperation with the Programme Countries.

As described in the needs, the HEP community in the partner countries HEIs is just too small, or the local situation too complex, to be able to start by themselves a training in the subject. Local funding won't help. National funding won't be synchronized in time and objective. Regional funding (e.g. across countries together) is not a thing of that region on large scale. So a coordinated action is needed and Erasmus+ does it. It takes one-off capital investments to set up the platform and to create the e-learning tools and content. Erasmus+ by design with implementation/education objectives allows to do that.

Long-term links between the educational setting in the Partners Countries and Programme countries are beneficial for researcher mobility, participation in each others scientific infrastructures, and having a scientific workforce of similar capacity. Investment from the EU in this program will seed this and shape the educational program in a structure analogous to the ones in the EU, achieving the long-term targets. Alone the partner countries either cannot have (or cannot afford) the internship opportunities that the project can generate, both to come to research labs/institutes in Europe. In addition, a multi-institutional organization with ties to the EU carries a larger weight in motivating top tech companies at accepting students for internships, negotiating agreements and offering to students the best possibilities for their future.

D.5 Cross-regional cooperation

If your proposal is cross-regional, demonstrate the need for this cooperation between institutions from different regions. Please also explain the added value of this cross-regional cooperation for the targeted Partner Country institutions. (limit 2.000 characters)

Does not apply to our project since all partner countries are from same region 8: Latin America

PART E – Quality of the Project Design and Implementation

E.1 Project activities and methodology

Please provide a detailed description of the activities and the working methodology to be used for achieving the objectives (including major milestones, measurable indicators, etc.). (limit 6.000 characters)

The collaborative work of the 21 institutions participating in LA-CoNGA Physics will be structured in 6 work packages (WP): WP1 (Preparation), WP2 (Development and installation of tools), WP3 (Training and education), WP4 (quality plan), WP5 (Dissemination, awareness and exploitation) and WP6 (management). Each WP has, in turn, several activities (described in E.5 and E.6). Responsibilities for each work package is distributed among the partners taking into account their expertise.

WP1 (Preparation) deals with a more in-depth review (with respect to the preliminary needs survey performed for this proposal described in D.1) of existing teaching methods, curricula and instrumentation laboratories in the Partner Country HEIs in light of the latest e-learning technologies and the comparable programmes in the partnering Programme Country HEIs and others institutes. Methodologies used here are internet search, explorative open and closed questionnaire surveys, that will be subject to quantitative and qualitative analyses. The outcome of this work will be assessed by the External Advisory Committee and the revised curricula, teaching methods and equipment will be summarized in a report discussed and defined by the partners at a virtual project meeting at the end of M4. The measurable indicators for WP1 are related to the results of the discussion/decisions at the meetings, the surveys and desk study as well as the detailed report of the proposed curricula for the one-year master/specialization program, teaching methods and required equipment.

WP2 (Development and installation of tools) activities are based on the recommendations from the review in WP1. WP2 is designed to accomplish the following:

- Extend, integrate and implement the e-learning RedCLARA platform that will be used to gather the resources of the project, discussion forum for students/staffs. Production of documentation in English and Spanish and also video tutorials. Members of the team will be trained to use the platform by videoconference, how to adapt contents and formats and create new e-learning modules taking into account local settings and target group needs.
- Buying and installation of the required laboratory equipment in each Partner Country HEI between M4 and M9 using the Erasmus+ budget. The main ideas are diversification and cost optimization, each laboratory will focus in only one particle detection technique (Resistive Plate Chambers RPCs, Water Cherenkov Detectors WCDs, Scintillators, etc), students, teaching and technical staff will have remote access to the detection system and data will be stored in a central repository. A prototype testbench will be installed to allow students to develop, construct and test data acquisition modules.

It will start in M5 and continue up to M11. The measurable indicators for WP2 are the e-learning tool and laboratories themselves.

WP3 (Training and education) activities are based on the recommendations from the review in WP1. WP3 is designed to accomplish the following:

- Implementation of the master one year program including development of the e-learning mini-modules with content related to the theoretical side: quantum field theory, particle and statistical physics as well as cutting-edge instrumentation and data analysis. The master will also include:
 - Data challenges with data from CERN, PAO, LAGO installations. Non-academic data from industry associated partners will also be considered. These data challenges will require students to develop new algorithms or instruments to solve real problems.

- A mobility scheme between Latin-American countries and also with Europe with the support of our associated partners from academia and industry.
- A one week network-school (NS) will take place towards the end of the one-year master program where the students will have the opportunity of presenting their work but also we will have trainings specifically focused on CV, interviews and self-assessment, as well as specific trainings and keynote speeches highlighting their challenges and successes from the non-academic sector partners.

A first version of the master will take place between M12 and M21. This first one will help us gather information and learn what needs to be changed (new material, new teaching techniques) before the second version takes place between M24 and M33.

WP3 will start in M5 and continue up to M33. Training course series (to guide the staff training processes) as well as the master course materials will be made available via an online extranet. The measurable indicators for WP3 are the number of capacity building activities and mobility for both staff and students and these are closely monitored through learning agreements and compulsory feedback between sending/hosting institutions and the staff/students.

WP4 (Quality Plan) will comprise detailed activities of evaluation. In order to continuously improve the project and its outcomes during the project lifetime, a number of different evaluation measures will be undertaken (see E.6 for more details).

WP5 (Dissemination and Exploitation) is related to the dissemination of the results of the project and to its sustainability. In order to generate awareness and to widely disseminate project results to relevant target groups and stakeholders and thus meet the main objective, communication measures will be implemented via different channels: through the media, during our NSs, citizen science projects, publications. The measurable indicators are the developed strategy and the organized dissemination activities. Regarding sustainability, a feasibility study will be done to develop Double Master degrees, as well as the established long - term activities like outlines for future summer schools and a teacher alumni network. Associated partners will also collaborate in terms of dissemination of the results of the project using their contact networks.

WP6 (management) is related to the implementation of tools for the consortium partners to communicate efficiently, to provide clear and simple timelines and guidance on project reporting (internal and external), organize face-to-face meetings for the project partners to exchange ideas and work together on the set goals and keep the costs within the set budget. Measurable indicators for WP6 are the number of organized Board meetings and other type of meetings (e.g. task force meetings), the consortium communications and the reports and financial audits submitted according to the Work Plan in E.4

The LA-CoNGA Physics agenda is described in what follows. The training activities will start in the first month of the project with a **Kickoff Meeting (KM)** including all members of the External Advisory Committee (EAC), representatives from all Partners and Beneficiaries, aiming to (a) discuss the exact deliverable of all WP and their relation; (b) plan in details the first six months of work; and (c) finalise the Consortium Agreement and establish management structures. Activities of the network will be coordinated through **Annual General Meetings (AGM)**, which will serve four main purposes: (a) reporting of the results obtained in each WP; (b) knowledge transfer among participants; (d) knowledge sharing of the problems solved during the activities. The three AGMs will feature management meetings where the progress of scientific and other activities will be monitored. The first AGM will coincide with the mid-term meeting and the report to the EU. The second AGM will also design a **roadmap for the sustainability** of the research, educative and training infrastructure. The third AGM will be devoted to internal and external evaluation and the generation of a summary document.

Please demonstrate that the activities and the methodology mentioned are the most appropriate to achieve the envisaged results and that they are feasible. (limit 3.000 characters)

Through the creation of a VRLC all the partner HEIs will have granted access to highly qualified professors/trainers currently working in the program, partner and associated institutions. The Latin-american HEP community is currently too small to cooperate in order to create the 'talent pipeline' and start teaching this discipline. Without this project this won't be possible (not enough local resources, not enough structure) and by doing the project we can deliver on a long-term shared objective (growing the community).

The activities of this VRLC will rely on the use of information and communications technology (ICT) tools, an e-learning platform, because all the members will be in different countries. This type of technologies and teaching methods have been successfully used and reproduced in the past, e.g. the CEVALE2VE experience. This is also the most economic way to address the needs of the partner countries HEIs. LA-CoNGA Physics will train teachers and technical staff to use these ICT tools to ensure the sustainability of the activities of the VRLC.

On the other hand given the importance of digital skills and of integrating cutting edge technologies in higher education the virtual course that will be developed within the project will have a component related with instrumentation and a component related to data analytics and machine learning techniques. Hands-on activities are very important in this context and this is why the project will support local institutions in setting up small laboratories, instrumentation and computing resources aimed at providing practical experience to students.

Finally, the envisage results regarding internationalisation of the partners HEIs will be achieved by enabling a mobility program for students, including international travels for internships and network schools. Clearly, the internationalization will be established in two levels: from the intra-regional links among the HEIs in Latin America and with the European institutions. The structure of the curricula and the opportunities offered to students (e.g. instrumentation and IT practices at home and internship) will naturally mimic the structure used in EU universities where the participants to the projects work, which is a model that works. The working practices in EU in the field at the edge of research and education is what LA-CoNGA Physics will introduce as it will start HEP education bottom up from scratch - these practices have been very successful in making EU a HEP powerhouse (e.g. the students first do practices at home, then get sent to labs to do theses).

What concrete, tangible results are expected to be achieved at the end of the project's activities in each of the targeted Partner Countries? (limit 6.000 characters)

All the members of the LA-CoNGA Physics will be part of a VRLC and as such a common set of tangible results are expected at the end of the project. Below is the list of tangible results per WP leading to the specific objectives of the project is presented:

WP1: Preparation

- Report summarising the revised curricula, teaching methodologies and equipment needed in each partner country HEI for the development of the project.

WP2: Development and installation of tools

- e-learning platform for LA-CoNGA Physics: based on the tools that currently exist in the Colaboratorio by redCLARA and the CEVALE2VE projects. The tools, software and

knowledge to create, maintain and enhance the web-based platform and other media is based on Open Source technology (see Figure 2). The aim is to use the resources we already have and to deploy new web-based and offline platforms where the content can be hosted and distributed, in a Software as a service (SaaS) model. Guides, documents and tutorial plan to be freely distributed in many different formats with their corresponding training being done in WP3.

- Connected instrumentation laboratories for LA-CoNGA Physics: a research/training facility will be installed in each HEI of Latin America, two main assumptions were made to define the quantity and the scope of the labs: optimization of budget and maximization of usability. In order to optimize budget each lab will be equipped with electronic components and instruments specialized for an specific task:
 - Prototyping, testing and development of particle and radiation detector systems
 - Training and research in Cosmic Rays (CR) particle detection based on Cherenkov effect (Water Cherenkov Detectors)
 - Training and research in Radiation and Particle detection based on plastic scintillators plus Silicon Photomultipliers (SiPMs)
 - Training and research in Astroparticle detection based on gaseous detectors (Resistive Plate Chambers)
 - Training and teaching on principles of radiation detection and data analysis (alpha, gamma, CR) with imaging applications (PET)

To maximize usability all the instruments are going to be connected to a LAN network, a workstation with dedicated software (LabView or OpenLab) will be used to control and setup all the tasks of the system, from calibration to execution of automated tests and experiments. A remote connection application will be developed in order to allow users from outside the HEIs to access the lab equipment, so they can perform training sessions, run experiments, collect data, etc. The exact description of the lab that will be installed in each partner country HEI can be found in Section E.6 and it is also shown in Figure 3.

- Guides, documents and tutorials will freely distributed in many different formats for teaching and technical staff

WP3: Training and education

- Training sessions for teachers and technical staff performed by videoconference. They will cover how to use the e-learning platform, the instrumentation labs and to design and implement Massive Open Online Courses (MOOCs). This is very important to ensure the sustainability of the project.
- HEP master/specialization courses: the course will be online/virtual. The master will include three mandatory courses to learn the basic of HEP research (theory, instrumentation and data handling) during the first semester and then during the second semester students will be able to tailor their training with elective courses (see Figure 4). Master course materials will be made available via an online extranet available to all partners, students and general public through MOOCs.
- Mobility scheme for students: students will have the possibility of doing an internship in academic or non-academic institutions in the partner countries or in Europe. A total of 4 internships per HEI per year will be offered, two to Europe and two within Latin American. Students not entering in the mobility scheme after the selection by the Executive Board will obtain high quality internships locally with co-supervision from associated partners and work will be done virtually.
- Network schools (NS): Two one-week network schools with mandatory participation of all students will be organised at the end of each one-year program. The students will present the work performed during the internships, and will also attend talks and hands-on sessions provided by experienced teachers from academic and non-academic sectors. The specific lectures provided at schools will be supplemented by activities to

discuss scientific dissemination and communication, trainings for CV, interviews and self assessment to give them the tools to get ready for their professional future.

WP4: Quality plan

- Internal Quality Assurance: Online questionnaires for current/former students about quality of their training, staff surveys about teaching resources and facilities as well as inquiries towards the associated partners about the performance of the students during the mobility scheme. A full report will be prepared for the Executive Board (EB) meetings to be held every six months.
- External Quality Assurance: These reports will be prepared and will consist of an evaluation of the curricula (M11) and the feasibility of its implementation, of the mobility scheme results (M21 and M33) as well as an evaluation of the management (M12, M23, M36). It will be performed by the EAC.

WP5: Dissemination & exploitation

- Detailed communication and Dissemination; Sustainability and Data Management and Protection Plans will be provided (see Section E.6 for more details)
- Website and social media:
- Outreach activities and citizen science projects (see Section E.6 for more details)
- Data challenges: with data from CERN, PAO, LAGO installations. The use of non-academic data from associated partners will also be considered. These data challenges will require students to develop new algorithms or instruments to solve real problems.

WP6: Management

- Consortium Agreement signature
- The PI and co-PI will overview the full project, make sure timescales are met and milestones are achieved.
- Project meetings, risk registry and conflict resolution. Risks will be monitored in a risk registry by the PI and co-PI. The registry will be reviewed and updated at each SB meeting, to put in place preventive mitigation measures whenever needed.
- Financial and general status report at each meeting EB/AGM

*For all **types of activities** (curriculum development, modernisation of governance, management and functioning of HEIs; strengthening of relations between HEIs and the wider economic and social environment), for **each Partner Country institution** please provide information in Part F.2 Organisation and Activities.*

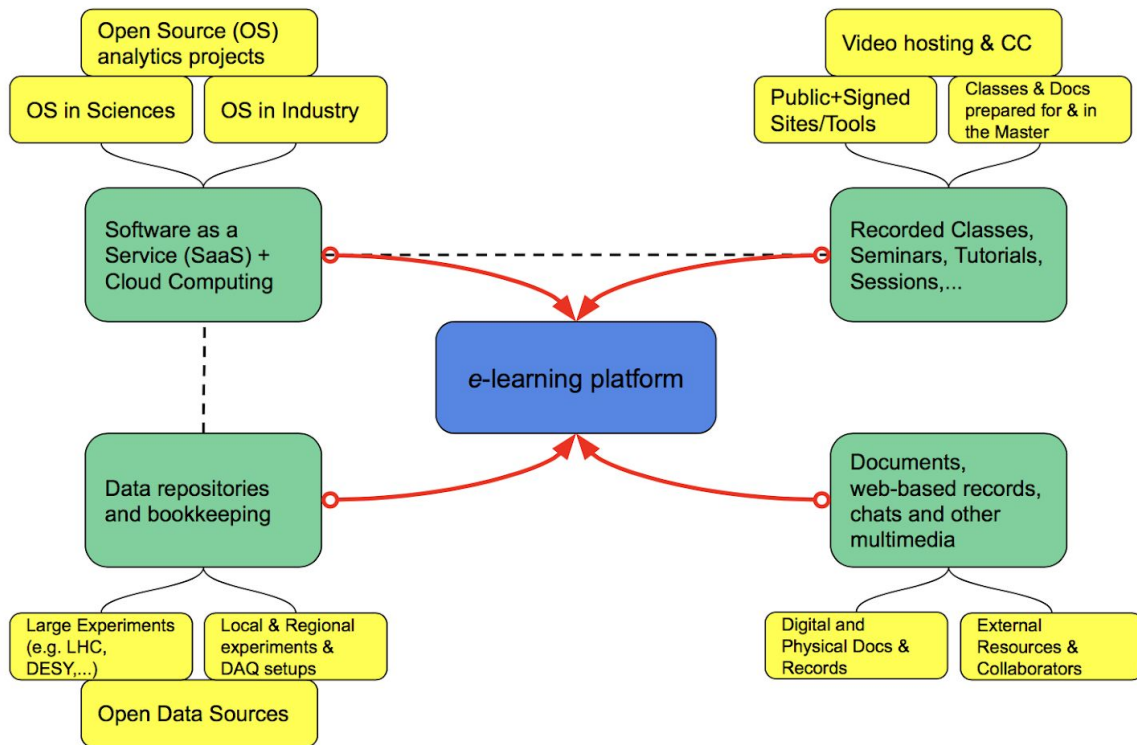


Figure 2. Tools for the e-learning platform, and their logical connexions

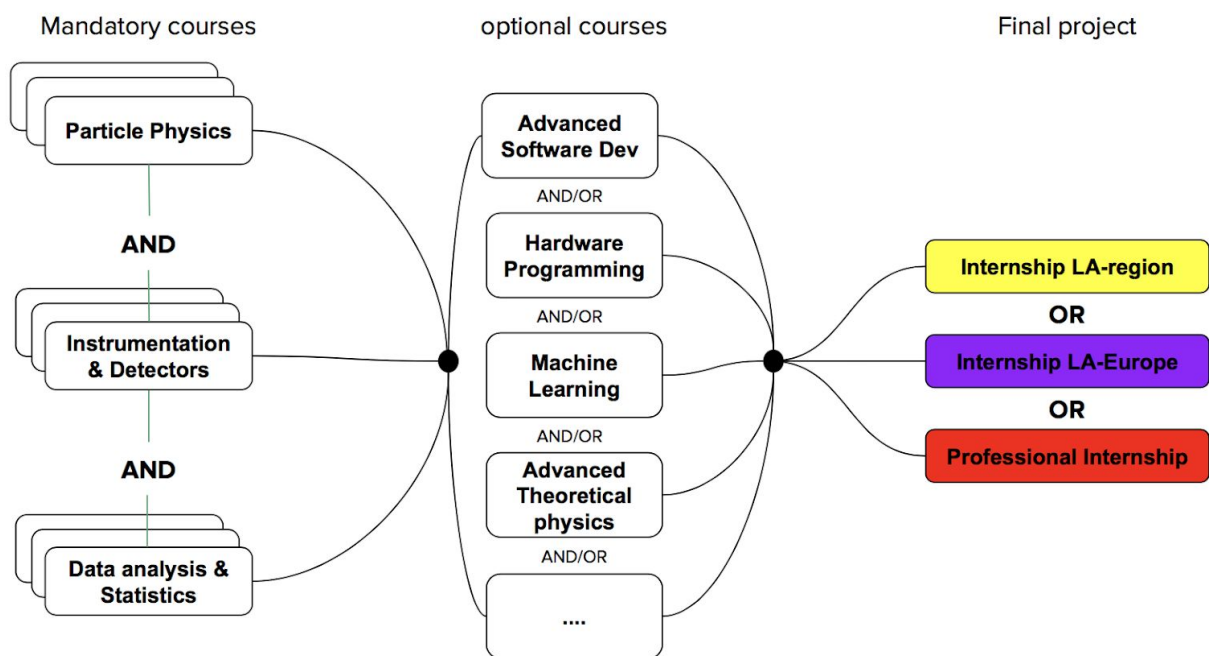


Figure 3. Global structure of the one-year master/specialization of LA-CoNGA Physics

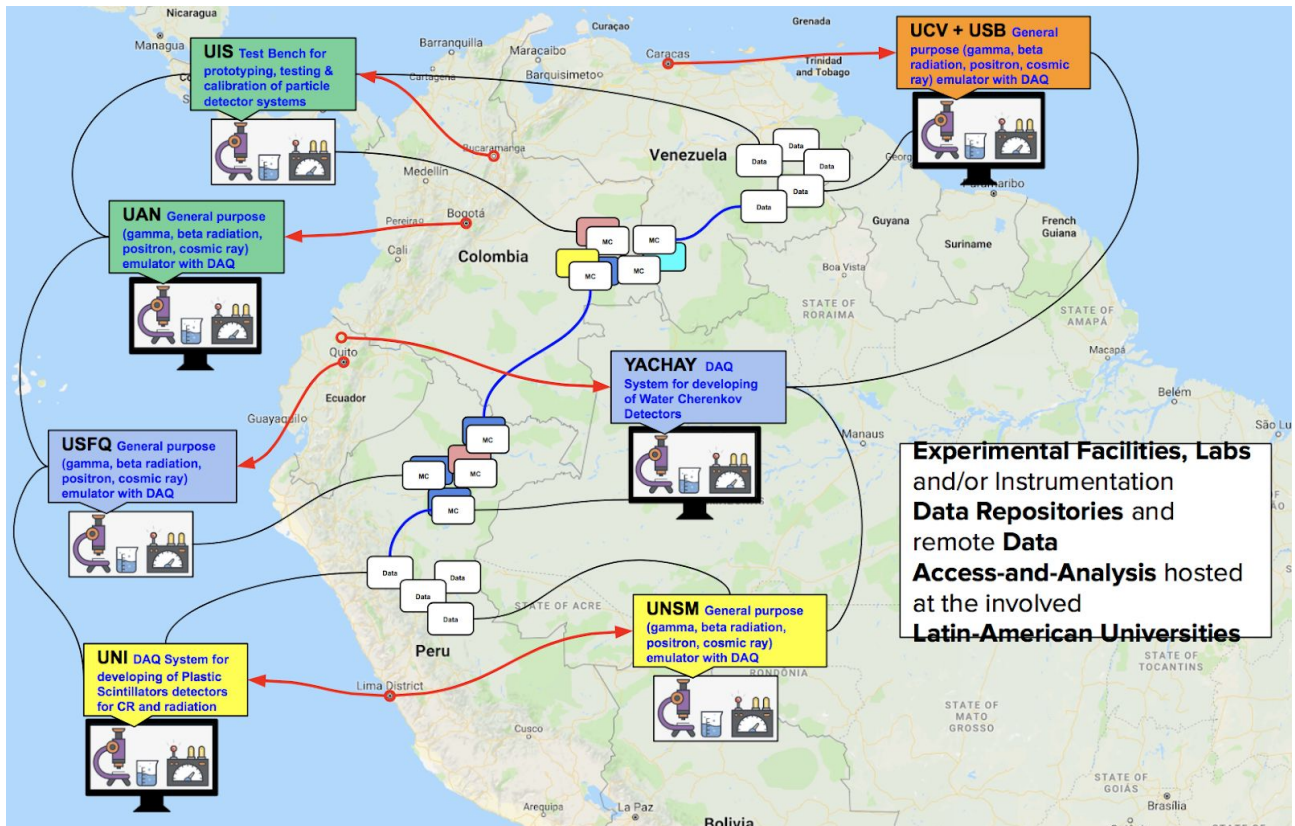


Figure 4. Global structure of the connected instrumentation labs of LA-CoNGA Physics

E.2 Quality control and monitoring

Please explain what mechanisms will be put in place for ensuring the quality of the project and how the evaluation will be carried out. If an external evaluation is foreseen, provide information on the purpose and expected outcomes of this evaluation. Please define the specific quality measures established, as well as the benchmarks and indicators foreseen to verify the outcome of the action. Make sure that the information in this section is consistent with the project Logical Framework Matrix. (limit 3.000 characters)

The overall Project progress monitoring will follow a bottom-up approach: reports will be presented during the AGMs by each WP leader to the Executive Board (EB) and Principal Chairs (PI José Ocariz from the European side, Paris Diderot and a co-PI from Latin America, Luis Nunez, from UIS). Each report will summarize the progress of the project and it will highlight any deviations from the plans, and will be monitored in relation to: times and costs; consistency with the research objectives; risks; quality; deliverables achievement. Following monitoring results, the SB, PI and co-PI will take any needed actions in a top-down mode. The summary of this interaction will be presented by the PI to the External Advisory Board (EAB) when appropriate, that in turn will give feedback.

The evaluation of the master curricula and the feasibility of its implementation, will be executed by the EB, PI, co-PI and the EAB. The quality of the training/courses, in its content and effectiveness, will be managed respectively through feedback questionnaires and evaluation tests for students, staffs and also inquiries towards the associated partners about the performance of the students during the mobility scheme. The scientific quality of the students work will be monitored by internal peer reviewing (external in case of submission to journals, internally organised otherwise).

The list of indicators to be used in the evaluation of the project divided by WP is the following:

WP1: Preparation

- * Detailed report and statistical analysis of surveys

WP2: Development and installation of tools

- * Count extensions developed for the e-learning platform. Verify they are working and satisfy the objectives
- * Count number of connected instrumentation labs installed in HEIs

WP3: Training and education

- * Count number of trainings organised, number of trained people
- * Count number of online courses developed for the HEP one year master/specialization
- * Number of students in master program
- * Count number of visits abroad, number of internships in academic and non academic associated partners

WP4: Quality plan

- * Count number of quality reports in consortium meetings

WP5: Dissemination and exploitation

- * Count number of outreach and citizen science events organised

WP6: Management

- * Count number of organized EB meetings and other type of meetings (e.g. task force meetings)
- * Count the disseminated consortium communications
- * Count reports and financial audits submitted

E.3 Budget and cost effectiveness

Please describe the strategy adopted to ensure that the proposed results and objectives will be achieved in the most economical way, and on time. Explain the principles of budget allocation amongst partners. Indicate the arrangements adopted for financial management. What sources of co-funding will be used? (limit 3.000 characters)

The budget allocation for staff costs amongst partners was done trying to have a balance between all the HEIs but also respecting the percentage of work each member of the team could devote to the project. The same principle was used for the travel and living costs budget. For example, all the partner countries HEIs will have a total of 4 internships per HEI per year will be offered, two to Europe and two within Latin America. And budget for all the active members of the team to participate in the AGMs was also allocated.

In order to optimize budget and achieve the proposed results and objectives in the most economical way each lab will be equipped with electronic components and instruments specialized for an specific task. To maximize usability all the instruments are going to be connected to a LAN network, a workstation with dedicated software (LabView or OpenLab) will be used to control and setup all the tasks of the system, from calibration to execution of automated tests and experiments. A remote connection application will be developed in order to allow users from outside the HEIs to access the lab equipment, so they can perform training sessions, run experiments, collect data, etc. Remote connection capability is useful also for periodic calibration, maintenance and troubleshooting of the system when necessary. The project also involves subcontracting costs for a web programmer and a labview programmer. They will work on the development of the e-learning platform, setup the project's website and the remote connection between the instrumentation labs.

The sources of co-funding used are coming from the partner countries HEIs. They contribute the time of administrative and technical staff time, as well as with the IT kit for the virtual courses, the connectivity and the local space.

As coordinator and given the expertise of UPD with EU projects it was decided among all the partners that financial management will be centrally done by UPD through the Department of Physics (UFR de Physique). It was also decided to have a co-PI in Latin America from UIS to help and support the PI. A project manager will support the PI with the financial management. See the budget table for more details.

Note: Given the connection between UPD and CNRS, CNRS is an affiliated institution of UPD, CNRS was included in the budget as part of UPD.

If your project involves any "exceptional costs" related to travel, please justify them here. (limit 2.000 characters)

It does not involve exceptional costs

Please justify the equipment costs for each Partner Country Institution:

- why the Partner Country institutions need them for the implementation of the project;
- their relations with the content to be developed and the specific activities to be implemented) and
- the estimated timeframe for their purchase as well as the estimated place where they will be located (limit 3.000 characters)

The equipments are needed in the context of the utilisation of new technologies in Higher Education. Some of the partner countries HEIs never used HEP scientific instruments. These instrumentation labs are fundamental for the HEP hands-on activities during the one year master and also for the citizen science activities. Buying and installation of the required laboratory equipment in each Partner Country HEI between M5 and M9 using the Erasmus+ budget and the purchase will be done to CAEN, one of the main instrumentation companies providing a scientific instruments which meet IEEE Standards for Nuclear and Particle Physics.

Taking into account that Venezuelan HEIs will share the lab, 7 facilities are going to be implemented, with 5 different types of labs, 1 of them will be replicated 3 times in different countries. Expertise, technological background of local teams and geographical distribution was taken into account for the distribution of the equipment. Follows a detailed description of the labs (characteristics and location):

- Prototyping, testing and development of particle and radiation detector systems (UIS).

Composition of test bench: a high performance mixed oscilloscope (4 analog channels, 16 digital channels, 5GS/s, 500MHz bandwidth), a programmable signal and function generation, High precision HV multimeter and a low noise power supply, 1 Workstation.

- Training and research in Cosmic Rays (CR) particle detection based on Cherenkov effect (Water Cherenkov Detectors) (UAN).

Instrumentation: 4 9" PMTs, High Stability High Voltage Power supply, 8 channel digitizer, 2 channel analog oscilloscope, 1 Workstation

- Training and research in Radiation and Particle detection based on plastic scintillators plus Silicon Photomultipliers (SiPMs) (UNI).

Instrumentation: Arrays of SiPMs with sensor holders, plastic scintillators, low noise amplifiers, 16 channel digitizer, 2 channel analog oscilloscope, 1 Workstation

- Training and research in Astroparticle detection based on gaseous detectors (Resistive Plate Chambers) (USFQ).

Instruments: RPC gaps, VME crate with 16 channel digitizer, low noise High Voltage Power Supply, USB bridge, 2 channel analog oscilloscope, 1 Workstation

- Training and teaching on principles of radiation detection and data analysis (alpha, gamma, CR) with imaging applications (PET) (YACHAY, UNSM, USB&USV)

Instrumentation: Radiation and CR emulator, Data Acquisition System, Data Processing Software, 1 Workstation

An appropriate space with electrical and safety installations, materials and tools as well as connectivity infrastructure to allow remote access of lab from HEIs will be granted and implemented by each University.

Please complete the following Logical Framework Matrix:

E.4 Logical Framework Matrix – LFM				
Wider Objective: <i>What is the general objective, to which the project will contribute?</i> Support the modernisation of HEIs through the use of new technologies in 8 universities from Venezuela, Peru, Ecuador and Colombia. Using High Energy Physics (HEP) as user case.	Indicators of progress: <i>What are the key indicators related to the wider objective?</i> * Development of open educational resources * Acquisition of digital skills * Development of learning methods * Mobilisation of stakeholders	How indicators will be measured: <i>What are the sources of information on these indicators?</i> * Count number of open educational resources developed for LA-CoNGA * Count number of training for digital skills, trained people * System of mobility scheme: count number of visits, number of internships, number of events organised		
Specific Project Objective/s: <i>What are the specific objectives, which the project shall achieve?</i> SMART implementation obj: * Integrate an e-learning platform from proven settings in RedCLARA and CEVALE2VE * Update training facilities at partnering HEIs, i.e. connected instrumentation laboratories SMART educational obj: * Develop online courses for a one-year master/specialization on HEP with a strong component of data analytics, ICT and scientific instrumentation hands-on activities SMART training objectives: * Train technical and academic staff, as well as students target groups to use new facilities * Enable the careers of the academic staff and students to target groups through the program and beyond	Indicators of progress: <i>What are the quantitative and qualitative indicators showing whether and to what extent the project's specific objectives are achieved?</i> * Extensions developed for the e-learning platform * Connected-interconnected instrumentation laboratories * Training offered for teachers and technical staff * Online courses developed for students * Mobilisation of stakeholders * Professional development training for all LA-CoNGA * Outreach events * Citizen science activities	How indicators will be measured: <i>What are the sources of information that exist and can be collected? What are the methods required to get this information?</i> * Count extensions developed for the e-learning platform. Verify they are working and satisfy the objectives * Count number of connected instrumentation labs installed in HEIs * Count number of trainings organised, number of trained people * Count number of online courses developed for the HEP one year master/specialization * Number of students in master program * Count number of visits abroad, number of internships in academic and non academic associated partners * Number of outreach and citizen science events organised	Assumptions & risks <i>What are the factors and conditions not under the direct control of the project, which are necessary to achieve these objectives? What risks have to be considered?</i> * R.1: Partners not signing the consortium agreement * R.2: Partners not complying with planned objectives or complying with delays * R.3: Participating group is unable to deliver * R.4: Participating group underperforms * R.5: Lack of computer literacy, members of the team not using the e-learning tools developed * R.6: Missing a key expertise during the execution of the project, which could slow down or stop an activity * R.7: Leaving of a supervisor/teacher/contact (e.g. career move) * R.8: Higher Education in Venezuela is enduring difficult conditions for academic and scientific activities. The economical and social situation is unstable.	How the risks will be mitigated: * R.1: Contacts with university authorities established several months ago and we obtained their agreement. * R.2: Reminders to be sent regularly when input is not delivered when deadline gets closer prepare a backup option to fit with the deliverables and regular meetings * R.3: Redundancy assures continuity of work * R.4: Additional training measure will be implemented * R.5: Organise training sessions so the members learn how to use them * R.6: Redundancy in the know-how of the participating groups ensures smooth continuity in the activity even if one group has serious difficulties; for example in case support from redCLARA is limited we also have the SCRIPT service at UPD * R.7: Beneficiaries and Partners have enough manpower to ensure the replacement of supervisors, while the rest of the supervisory team ensures continuity * R.8: Help will be provided by close partner countries HEIs to achieve LA-CoNGA objectives

Outputs (tangible) and Outcomes (intangible): <i>Please provide the list of concrete DELIVERABLES - outputs/outcomes (grouped in Work packages), leading to the specific objective/s.:</i>	Indicators of progress: <i>What are the indicators to measure whether and to what extent the project achieves the envisaged results and effects?</i>	How indicators will be measured: <i>What are the sources of information on these indicators?</i>	Assumptions & risks <i>What external factors and conditions must be realised to obtain the expected outcomes and results on schedule?</i>	How the risks will be mitigated:
<p>WP1: Preparation *Report of curricula, methodologies and equipment</p> <p>WP2: Development and installation of tools * e-learning platform for LA-CONGA Physics * Connected instrumentation laboratories for LA-CONGA * Training guides for teaching and technical staff</p> <p>WP3: Training and education * Training sessions for teachers and technical staff * HEP master/specialization courses * Mobility scheme for students * Network schools (NS)</p> <p>WP4: Quality plan * Internal Quality Assurance * External Quality Assurance</p> <p>WP5: Dissemination & exploitation * Communication and Dissemination; Sustainability and Data Management and Protection Plan * Website and social media * Outreach activities and citizen science projects * Data challenges</p> <p>WP6: Management * Consortium Agreement signature * Project meetings, risk registry and conflict resolution * Financial and general status report at each EB/AGM</p>	<p>WP1: Preparation * Meetings minutes * The surveys and desk study * Detailed report of the proposed curricula for the one-year master/specialization program, teaching methods and required equipment</p> <p>WP2: Development and installation of tools * e-learning tool and instrumentation laboratories themselves</p> <p>WP3: Training and education * number of capacity building activities and number of participants * mobility for both staff and students * compulsory feedback between sending/hosting institutions and the teaching staff/students</p> <p>WP4: Quality plan * Quality reports in consortium meetings</p> <p>WP5: Dissemination and exploitation * Outreach events, citizen science activities and data challenges * feasibility study produced to develop Double Master degrees</p> <p>WP6: Management * number of organized EB meetings and other type of meetings (e.g. task force meetings) * the disseminated consortium communications * reports and financial audits submitted</p>	<p>WP1: Preparation * Detailed report and statistical analysis of surveys</p> <p>WP2: Development and installation of tools * Count extensions developed for the e-learning platform. Verify they are working and satisfy the objectives * Count number of connected instrumentation labs installed in HEIs</p> <p>WP3: Training and education * Count number of trainings organised, number of trained people * Count number of online courses developed for the HEP one year master/specialization * Number of students in master program * Count number of visits abroad, number of internships in academic and non academic associated partners</p> <p>WP4: Quality plan * Count number of quality reports in consortium meetings</p> <p>WP5: Dissemination and exploitation * Count number of outreach and citizen science events organised</p> <p>WP6: Management * Count number of organized EB meetings and other type of meetings (e.g. task force meetings) * the disseminated consortium communications * Count reports and financial audits submitted</p>	<p>* R.1: Partners not complying with planned objectives or complying with delays * R.2: Participating group is unable to deliver * R.3: Participating group underperforms * R.4: Missing a key expertise during the execution of the project, which could slow down or stop an activity * R.5: Leaving of a supervisor/teacher/contact (e.g. career move) * R.6: Access to the e-learning platform limited * R.7: The eventuality of RedCLARA disappearing * R.8: Delay in the delivering of the instruments and equipment due to national custom procedures. * R.9: High increases in the prices quoted in the budget * R.10: Delay in planned internships * R.11: More students participating in the program than budgeted</p>	<p>* R.1: Reminders to be sent regularly when input is not delivered when deadline gets closer prepare a backup option to fit with the deliverables and regular meetings * R.2: Redundancy assures continuity * R.3: Additional training measure will be implemented * R.4: Redundancy in the know-how of the participating groups ensures smooth continuity in the activity even if one group has serious difficulties; for example in case support from redCLARA is limited we also have the SCRIPT service at UPD * R.5: Beneficiaries and Partners have enough manpower to ensure the replacement of supervisors, while the rest of the supervisory team ensures continuity * R.6: RedCLARA brings together almost 1000 universities in the Latin American continent and is interested that the tools (developed mainly with EU funds) are public/open access for all the members of the HEIs community, so that they can be used in other fields apart from HEP. Initially having the platform in RedCLARA, a stable institution, ensures the access to the tools once the project finishes * R.7: RedCLARA has more than 15 years of activities. In this eventuality RedCLARA will make sure of doing all the necessary backups to move the platform to other repositories at the universities. * R.9: We will look for other providers. For some of the labs there is also some overlap between labs * R.10: Perspective internship host have been identified by name and verified to fulfill the eligibility conditions. Some flexibility on dates possible. * R.11: In that case we will make sure that students not entering in the mobility scheme after the selection by the Executive Board will obtain high quality internships locally with co-supervision from associated partners and work will be done virtually.</p>

Activities:	Inputs:		Assumptions & risks	How the risks will be mitigated:
<p><i>What are the key activities to be carried out (grouped in Work packages) and in what sequence in order to produce the expected results?</i></p> <p>WP1: Preparation</p> <ul style="list-style-type: none"> * explorative open and closed surveys at each HEI * investigation of existing tools in the Colaboratorio <p>WP2: Development and installation of tools</p> <ul style="list-style-type: none"> * Setup of the e-learning platform * Installation of each HEI instrumentation platforms * Interconnexion of HEI platforms <p>WP3: Training and education</p> <ul style="list-style-type: none"> * Training sessions for teachers and technical staff * Curricula for the HEP master and evaluation by EAC * HEP master/specialization courses * Mobility scheme for students * Network schools (NS) <p>WP4: Quality plan</p> <ul style="list-style-type: none"> * IQA: surveys, reports every 6 months during EB * EQA: evaluation of the management and first AGM <p>WP5: Dissemination & exploitation</p> <ul style="list-style-type: none"> * Create website and social media * Outreach activities and citizen science projects * Active gender equality promotion and monitoring * Data challenges <p>WP6: Management</p> <ul style="list-style-type: none"> * Consortium Agreement signature and Kickoff meeting * EB meetings every two months, AGM once per year * Financial and general status report at each EB/AGM 	<p><i>What inputs are required to implement these activities, e.g. staff time, equipment, mobilities, publications etc.?</i></p> <p>WP1: Preparation</p> <ul style="list-style-type: none"> * teaching staff time <p>WP2: Development and installation of tools</p> <ul style="list-style-type: none"> * report of curricula, methodologies and equipment from * equipment * teaching and technical staff time * web developer and programmer <p>WP3: Training and education</p> <ul style="list-style-type: none"> * equipment installed * teaching and technical staff time * administrative staff time * students time * cooperation/time from associated partners * mobilities <p>WP4: Quality plan</p> <ul style="list-style-type: none"> * Staff time <p>WP5: Dissemination & exploitation</p> <ul style="list-style-type: none"> * Staff time * web developer <p>WP6: Management</p> <ul style="list-style-type: none"> * PI, co-PI and PM's time 		<p><i>What pre-conditions are required before the project starts? What conditions outside the project's direct control have to be present for the implementation of the planned activities?</i></p> <ul style="list-style-type: none"> * R.1: Partners not complying with planned objectives or complying with delays * R.2: Participating group is unable to deliver * R.3: Participating group underperforms * R.4: Missing a key expertise during the execution of the project, which could slow down or stop an activity * R.5: Leaving of a supervisor/teacher/contact (e.g. career move) * R.6: Access to the e-learning platform limited * R.7: The eventuality of RedCLARA disappearing * R.8: Delay in the delivering of the instruments and equipment due to national custom procedures. * R.9: High increases in the prices quoted in the budget * R.10: Delay in planned internships * R.11: More students participating in the program than budgeted 	<p><i>How the risks will be mitigated:</i></p> <ul style="list-style-type: none"> * R.1: Reminders to be sent regularly when input is not delivered when deadline gets closer prepare a backup option to fit with the deliverables and regular meetings * R.2: Redundancy assures continuity * R.3: Additional training measure will be implemented * R.4: Redundancy in the know-how of the participating groups ensures smooth continuity in the activity even if one group has serious difficulties; for example in case support from redCLARA is limited we also have the SCRIPT service at UPD * R.5: Beneficiaries and Partners have enough manpower to ensure the replacement of supervisors, while the rest of the supervisory team ensures continuity * R.6: RedCLARA brings together almost 1000 universities in the Latin American continent and is interested that the tools (developed mainly with EU funds) are public/open access for all the members of the HEIs community, so that they can be used in other fields apart from HEP. Initially having the platform in RedCLARA, a stable institution, ensures the access to the tools once the project finishes * R.7: RedCLARA has more than 15 years of activities. In this eventuality RedCLARA will make sure of doing all the necessary backups to move the platform to other repositories at the universities. * R.9: We will look for other providers. For some of the labs there is also some overlap between labs * R.10: Perspective internship host have been identified by name and verified to fulfill the eligibility conditions. Some flexibility on dates possible. * R.11: In that case we will make sure that students not entering in the mobility scheme after the selection by the Executive Board will obtain high quality internships locally with co-supervision from associated partners and work will be done virtually.

E.5 Work Plan

WORKPLAN for project year 1

Activities		Total duration (number of weeks)	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12
Ref.nr/ Sub-ref nr	Title													
D6.1	KoM and signed CA	1	X											
D6.2	PM nomination	1	X											
D6.3	Institution of risk registry	4	X											
D5.4	setup LA-CoNGA Physics website and social media	4	X											
T1.1	explorative open and closed surveys at each HEI	14	X	X	X	X								
T1.2	investigation of existing tools in the Colaboratorio	15	X	X	X	X								
D1.1	Report of curricula, methodologies and equipment	2				X								
D5.1	Communication and Dissemination Plan	8			X	X								
T2.1	Setup of the e-learning platform	18					X	X	X	X	X			
T2.2	Installation of each HEI instrumentation platforms	20					X	X	X	X	X			
T2.3	Interconnexion of HEI platforms	8								X	X			
T2.4	Installation of IT kits	10					X	X	X					
D2.1	e-learning platform active	2									X			
D2.2	Instrumentation platforms active	2									X			
D2.3	Training guides	4										X		
D3.1	Technical training course for staff+technical groups	8											X	X
T3.2	Curricula for the HEP master and evaluation by EAC	20					X	X	X	X	X	X		
D4.2	EQA: evaluation of the curricula	2											X	
	EB meetings. To will be held every 2 months	1			X		X		X		X			X
D4.1	IQA: surveys, reports every 6 months during EB	4					X	X					X	X
D4.2	EQA: evaluation of the management and first AGM	1												X
D5.3	Data Management and Protection Plan	4										X		
T5.3	Internal and external dissemination through outreach	48				X	X	X	X	X	X	X	X	X
T5.10	Active gender equality promotion and monitoring	48	X	X	X	X	X	X	X	X	X	X	X	X

WORKPLAN for project year 2

Activities		Total duration (number of weeks)	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12
Ref.nr/ Sub-ref nr	Title													
D3.2	1st edition of the HEP master/specialization courses for LA-CoNGA Physics	20	X	X	X	X	X	X	X					
T3.3	Data challenges	2				X			X					
D5.5	Citizen science projects	2			X									
D3.3	Mobility scheme/internships for students	16							X	X	X	X	x	
D3.4	Network school	1										X		
D3.5	Master degree award	1											X	
T3.5	Update regularly the e-learning platform with the teaching/training material	40	X	X	X	X	X	X	X	X	X	X	X	
D4.2	External Quality assurance: evaluation by the EAC first course and mobility scheme	2											X	
D3.1	Technical training course for staff and technical groups	8											X	X
	Consortium meetings. The plenary AGM in this year will be held a few days before the NS	2	X		X		X		X		X		X	
D4.1	Internal Quality Assurance: surveys, reports every 6 months	4					X	X					X	X
D4.2	External Quality assurance: evaluation of the management presented at the plenary AGM	1											X	
D5.5	Internal and external dissemination of results through different outreach activities	48	X	X	X	X	X	X	X	X	X	X	X	X
T5.10	Active gender equality promotion and monitoring	48	X	X	X	X	X	X	X	X	X	X	X	X

WORKPLAN for project year 3

Activities		Total duration (number of weeks)	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12
Ref.nr/ Sub-ref nr	Title													
D3.2	1st edition of the HEP master/specialization courses for LA-CoNGA Physics	20	X	X	X	X	X	X	X					
T3.3	Data challenges	2				X			X					
D5.5	Citizen science projects	2			X									
D3.3	Mobility scheme/internships for students	16							X	X	X	X	X	
D3.4	Network school	1										X		
D3.5	Master degree award	1											X	
T3.5	Update regularly the e-learning platform with the teaching/training material	40	X	X	X	X	X	X	X	X	X	X	X	
D4.2	External Quality assurance: evaluation by the EAC first course and mobility scheme	2										X		
	EB meetings. The plenary AGM in this year will be held in M36, this will be the final consortium meeting	2	X		X		X		X		X			X
D4.1	Internal Quality assurance: surveys, reports every 6 months during EB meetings	4					X	X					X	X
D4.2	External Quality assurance: evaluation of the management presented at each AGM	1												X
D5.2	Sustainability Plan	6											X	X
D5.5	Internal and external dissemination of results through different outreach activities	48	X	X	X	X	X	X	X	X	X	X	X	X
T5.10	Active gender equality promotion and monitoring	48	X	X	X	X	X	X	X	X	X	X	X	X

Please complete the information on each work package for your project

E.6 Work packages

Please enter the different project activities you intend to carry out in your project. Make sure that the information in this section is consistent with the project Logical Framework Matrix.

Work package type and ref.nr	PREPARATION		1
Title	Preparation		
Related assumptions and risks	R1.1: Partners not complying with planned surveys or complying with delays.		
Description	This WP deals with a more in-deep review of existing teaching methods, curricula and laboratories in the Partner Country HEIs. A detailed needs assessment is a prerequisite for effective and efficient qualification and education programmes in HEP.		
Tasks	Task 1.1: perform explorative open and closed surveys at each HEI and their quantitative and qualitative analysis. Task 1.2: preliminary investigation of the tools that currently exist in the Colaboratorio by redCLARA and the CEVALE2VE project.		
Estimated Start Date (dd-mm-yyyy)	M1	Estimated End Date (dd-mm-yyyy)	M4
Lead Organisation	Universidad Nacional Mayor de San Marcos (UNMSM)		
Participating Organisation	UNMSM is the leading organisation for WP1. All the partner countries HEIs will carry out the task under the direction of UAN (concerning academic needs) and UNMSM (concerning equipment needs). The final report will be evaluated by the EAC in an virtual meeting to be organised in M4.		
Costs <i>Please explain the necessary costs for this WP: What travels are necessary? If equipment is requested, explain why it is required. If subcontracting is necessary, explain why the task cannot be performed by the partner.</i>	This WP will be launched during the Kickoff Meeting. It is important that a representative of each partner is present in the KM and therefore travel and stay costs are included in the budget.		

Deliverables/results/outcomes

Expected Deliverable/Results/Outcomes	Work Package and Outcome ref.nr	1.1.	
	Title	Report of curricula, methodologies and equipment	
	Type	<input type="checkbox"/> Teaching material <input type="checkbox"/> Learning material <input type="checkbox"/> Training material	<input type="checkbox"/> Event <input checked="" type="checkbox"/> Report <input type="checkbox"/> Service/Product
	Description	Report summarising the revised curricula, teaching methodologies and equipment needed in each partner country HEI for the development of the project. This report will include results of the Task 1.1 and 1.2.	

	Due date	End of M4
	Languages	English
Target groups	<input checked="" type="checkbox"/> Teaching staff <input type="checkbox"/> Students <input type="checkbox"/> Trainees <input checked="" type="checkbox"/> Administrative staff <input checked="" type="checkbox"/> Technical staff <input type="checkbox"/> Librarians <input checked="" type="checkbox"/> Other	
	<i>If you selected 'Other', please identify these target groups.</i> (Max. 250 words) The members of the consortium in the form of the Executive Board (EB) and the External Advisory Board (EAB)	
Dissemination level	<input type="checkbox"/> Department / Faculty <input type="checkbox"/> Local <input type="checkbox"/> National <input checked="" type="checkbox"/> Institution <input type="checkbox"/> Regional <input type="checkbox"/> International	

Please copy and paste tables as necessary.

Work package type and ref.nr	DEVELOPMENT		2
Title	Development and installation of tools		
Related assumptions and risks	<p>R2.1: Access to the <i>e-learning</i> platform limited, that some institutions can not access RedCLARA.</p> <p>R2.2: The eventuality of RedCLARA disappearing.</p> <p>R2.3: Lack of computer literacy, members of the team not using the <i>e-learning</i> tools developed.</p> <p>R2.4: Missing a key expertise during the execution of the project, which could slow down or stop an activity.</p> <p>R2.5: Delay in the delivering of the instruments and equipment due to national custom procedures.</p> <p>R2.6: High increases in the prices quoted in the budget</p> <p>R2.7: Leaving of a teacher/contact of a partner HEI (e.g. career move).</p>		
Description	Within this WP an <i>e-learning</i> platform adapted to the specific needs identified in WP1 will be developed. It also handles the construction of the instrumentation laboratories in the partner countries HEIs.		
Tasks	<p>Task 2.1: create the <i>e-learning</i> platform for LA-CoNGA Physics based on the tools that currently exist in the Colaboratorio by redCLARA and the CEVALE2VE project. The initial platform will be provided at redCLARA where all members will have open access.</p> <p>Task 2.2: Initial setup of the research facilities: a basic technological infrastructure have to be installed in the labs, Gigabit Ethernet network, a main server for remote access; with high speed links, buy and install specialized and general purpose testbench the equipment in each partner country HEI. Task 2.3: create remote connections to the instrumentation equipment in each HEIs. Task 2.4: Installation of IT kit on each HEI needed for the setup of classroom for the video-lectures.</p>		
Estimated Start Date (dd-mm-yyyy)	M5	Estimated End Date (dd-mm-yyyy)	M10
Lead Organisation	Universidad San Francisco de Quito (USFQ)		
Participating Organisation	Under the direction of USFQ different partner countries HEIs will organise the tasks within this WP: UCV and USB for task 2.1 and 2.5 with the support of our associated partners ICTP, redCLARA and CEVALE2VE; USFQ for task 2.2 and 2.3 with the support of CAEN (through SAIDESA) and Paris-Diderot and UNI for task 2.3		
Costs <i>Please explain the necessary costs for this WP: What travels are</i>	For the creation of the platform we need to hire two persons with expert knowledge in web development and cloud computing and also labview programming. The partner HEIs do not count with that expertise and the project needs a 100% dedication during these months.		

necessary? If equipment is requested, explain why it is required. If subcontracting is necessary, explain why the task cannot be performed by the partner.	<p>Instrumentation laboratories in the partner countries HEIs. Five different laboratories will be implemented according to specific particle detection techniques, prototyping of particle detectors and other applications (radiation and imaging), i.e:</p> <ol style="list-style-type: none"> 1. Detectors Prototyping Lab 2. PMT Lab 3. SiPM Lab 4. RPC Lab 5. Nuclear and Modern Physics Lab <p>Each lab will be installed in one HEI in Latin America, Lab 5 will be replicated in 3 Universities. HEIs of Venezuela are going to share infrastructure. All the instruments are going to be connected to a LAN network for both local and remote control and setup (see detailed information in WP 2.2.)</p>
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Deliverables/results/outcomes

Expected Deliverable/Results/ Outcomes	Work Package and Outcome ref.nr	2.1.	
	Title	e-learning platform for LA-CoNGA Physics	
	Type	<input type="checkbox"/> Teaching material <input type="checkbox"/> Learning material <input checked="" type="checkbox"/> Training material	<input type="checkbox"/> Event <input type="checkbox"/> Report <input checked="" type="checkbox"/> Service/Product
	Description	The e-learning platform for LA-CoNGA Physics based on the tools that currently exist in the Colaboratorio by redCLARA and the CEVALE2VE projects. The tools, software and knowledge to create, maintain and enhance the web-based platform and other media is based on Open Source technology. The aim is to use the resources we already have and to deploy new web-based and offline platforms where the content can be hosted and distributed, in a SaaS model. Guides, documents and tutorial plan to be freely distributed in many different formats with their corresponding DOI for easy tracking and identification of the material and authors. We plan to deliver protocols, documentation and a complete database of datasets coming from the different experiments and universities involved — also, ways to communicate with the members of the collaboration and all the users. We rely on the Open Source community in the scientific and commercial areas to obtain the software resources for this task, and we plan to contribute back to those open communities.. All services will be hosted into the RedCLARA infrastructure and another public partner's resources for access.	
	Due date	M9	
	Languages	English and Spanish	
Target groups	<input checked="" type="checkbox"/> Teaching staff <input type="checkbox"/> Students <input type="checkbox"/> Trainees <input type="checkbox"/> Administrative staff <input checked="" type="checkbox"/> Technical staff <input type="checkbox"/> Librarians <input type="checkbox"/> Other		
	If you selected 'Other', please identify these target groups. (Max. 250 words)		
Dissemination level	<input checked="" type="checkbox"/> Department / Faculty <input checked="" type="checkbox"/> Institution	<input checked="" type="checkbox"/> Local <input checked="" type="checkbox"/> Regional	<input checked="" type="checkbox"/> National <input checked="" type="checkbox"/> International

Expected Deliverable/Results/Outcomes	Work Package and Outcome ref.nr	2.2.	
	Title	Connected instrumentation laboratories for LA-CoNGA Physics	
	Type	<input checked="" type="checkbox"/> Teaching material <input type="checkbox"/> Learning material <input checked="" type="checkbox"/> Training material	<input type="checkbox"/> Event <input type="checkbox"/> Report <input checked="" type="checkbox"/> Service/Product
	Description	<p>A research/training facility will be installed in each HEI of Latin America, two main assumptions were made to define the quantity and the scope of the labs: optimization of budget and maximization of usability.</p> <p>In order to optimize budget each lab will be equipped with electronic components and instruments specialized for an specific task:</p> <ul style="list-style-type: none"> • Prototyping, testing and development of particle and radiation detector systems • Training and research in Cosmic Rays (CR) particle detection based on Cherenkov effect (Water Cherenkov Detectors) • Training and research in Radiation and Particle detection based on plastic scintillators plus Silicon Photomultipliers (SiPMs) • Training and research in Astroparticle detection based on gaseous detectors (Resistive Plate Chambers) • Training and teaching on principles of radiation detection and data analysis (alpha, gamma, CR) with imaging applications (PET) <p>To maximize usability all the instruments are going to be connected to a LAN network, a workstation with dedicated software (LabView or OpenLab) will be used to control and setup all the tasks of the system, from calibration to execution of automated tests and experiments. A remote connection application will be developed in order to allow users from outside the HEIs to access the lab equipment, so they can perform training sessions, run experiments, collect data, etc.</p> <p>Remote connection capability is useful also for periodic calibration, maintenance and troubleshooting of the system when necessary.</p> <p>Taking into account that Venezuelan HEIs will share the lab, 7 facilities are going to be implemented, with 5 different types of labs, 1 of them (number 5) will be replicated 3 times in different countries. Expertise, technological background of local teams and geographical distribution was taken into account for the distribution of the equipment.</p> <p>Follows a detailed description of the labs (characteristics and location)</p> <p>Prototyping, testing and development of particle and radiation detector systems (UIS).</p> <p>Composition of test bench: a high performance mixed oscilloscope (4 analog channels, 16 digital channels, 5GS/s, 500MHz bandwidth), a programmable signal and function generation, High precision HV multimeter and a low noise power supply, 1 Workstation.</p> <p>Training and research in Cosmic Rays (CR) particle detection based on Cherenkov effect (Water Cherenkov Detectors) (UAN). Instrumentation: 4 9" PMTs, High Stability High Voltage Power supply, 8 channel digitizer, 2 channel analog oscilloscope, 1 Workstation.</p>	

		<p>Training and research in Radiation and Particle detection based on plastic scintillators plus Silicon Photomultipliers (SiPMs) (UNI). Instrumentation: Arrays of SiPMs with sensor holders, plastic scintillators, low noise amplifiers, 16 channel digitizer, 2 channel analog oscilloscope, 1 Workstation.</p> <p>Training and research in Astroparticle detection based on gaseous detectors (Resistive Plate Chambers) (USFQ). Instruments: RPC gaps, VME crate with 16 channel digitizer, low noise High Voltage Power Supply, USB bridge, 2 channel analog oscilloscope, 1 Workstation</p> <p>Training and teaching on principles of radiation detection and data analysis (alpha, gamma, CR) with imaging applications (PET) (YACHAY, UNSM, USB&USV) Instrumentation: Radiation and CR emulator, Data Acquisition System, Data Processing Software, 1 Workstation.</p> <p>An appropriate space with electrical and safety installations, materials and tools as well as connectivity infrastructure to allow remote access of lab from HEIs will be granted and implemented by each University.</p>
	Due date	M10
	Languages	Does not apply
Target groups	<input checked="" type="checkbox"/> Teaching staff <input checked="" type="checkbox"/> Students <input type="checkbox"/> Trainees <input type="checkbox"/> Administrative staff <input checked="" type="checkbox"/> Technical staff <input type="checkbox"/> Librarians <input type="checkbox"/> Other	
	<i>If you selected 'Other', please identify these target groups. (Max. 250 words)</i>	
Dissemination level	<input checked="" type="checkbox"/> Department / Faculty <input checked="" type="checkbox"/> Institution <input type="checkbox"/> Local <input type="checkbox"/> Regional <input type="checkbox"/> National <input checked="" type="checkbox"/> International	

Expected Deliverable/Results/Outcomes	Work Package and Outcome ref.nr	2.3.	
	Title	Training guides for teaching and technical staff	
	Type	<input type="checkbox"/> Teaching material <input type="checkbox"/> Learning material <input checked="" type="checkbox"/> Training material	<input type="checkbox"/> Event <input type="checkbox"/> Report <input type="checkbox"/> Service/Product
	Description	Training guides for the use of the e-platform and the equipment in the instrumentation laboratories	
	Due date	M10	
	Languages	English and Spanish	
Target groups	<input checked="" type="checkbox"/> Teaching staff <input type="checkbox"/> Students <input type="checkbox"/> Trainees <input type="checkbox"/> Administrative staff <input checked="" type="checkbox"/> Technical staff <input type="checkbox"/> Librarians <input type="checkbox"/> Other		

	<i>If you selected 'Other', please identify these target groups. (Max. 250 words)</i>		
Dissemination level	X Department / Faculty X Institution	X Local X Regional	X National X International

Work package type and ref.nr	DEVELOPMENT		3
Title	Training and education		
Related assumptions and risks	<p>R3.1: Partners may not deliver input in time resulting in failure to meet the deadline. R3.2: Participating group is unable to deliver. R3.3: Participating group underperforms. R3.4: Delay in planned internships. R3.5: More students participating in the program than budgeted. R3.6: leaving of a teacher/contact person in the partner institution (e.g. career move). R3.7: Higher Education in Venezuela is enduring difficult conditions for academic and scientific activities. The economical and social situation is unstable.</p>		
Description	Organisation of local and global training, curriculum development, secondment monitoring and data challenges. This is where the real teaching happens.		
Tasks	<p>Task 3.1: Development and implementation of technical training course for staff and technical groups using the input from WP2, either in person or through free video conferencing system. Task 3.2: Design and implementation of the curricula for the HEP one year master/specialisation, with input from all partners and associated partners for content and format; reviewed by the EAC Task 3.3: Promotion and organisation of data challenges on data samples obtained from the scientific projects and non-academic partners. Task 3.4: Monitoring of the local arrangements for the students internships. Task 3.5: Organisation of two schools (NS), with scientific and transferable skills training (including preparation to professional future), with input from associated partners for content and format. Task 3.6: Update regularly the e-learning platform with the teaching/training material</p>		
Estimated Start Date (dd-mm-yyyy)	M5	Estimated End Date (dd-mm-yyyy)	34
Lead Organisation	Universidad Antonio Narino (UAN)		
Participating Organisation	<p>Under the direction of UAN different partner countries HEIs will organise the tasks within this WP: Yachay for tasks 3.1 and 3.4 with the support of the leaders of WP2 and WP1; and UAN will coordinate the others tasks with the support from the leader of WP1 and WP2 as well as the associated partners when appropriated. Data Challenges will be organised by ICTP. NS will be organised with local hosts (see Appendix B) and PI and co-PI. The training on future professional preparation by the New York Academy of Sciences, including coaching and online courses and they will be provided to the members of the consortium but also to local/regional groups like the Asociación Colombiana para el Avance de la Ciencia (ACAC) to ensure the sustainability.</p>		
Costs <i>Please explain the necessary costs for this WP: What travels are necessary? If equipment is requested, explain why it is required. If subcontracting is</i>	<p>Two network schools will be organised, one during the second year and another one during the third year of the project. A mobility scheme of students for internships/secondments in order to complement the training of the students, to reinforce multidisciplinary connections and/or visiting international laboratories. The mobility scheme will happen at the regional level and between Latin America and Europe. The detailed costs are detailed in the budget.</p>		

necessary, explain why the task cannot be performed by the partner.	
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Deliverables/results/outcomes

Expected Deliverable/Results/Outcomes	Work Package and Outcome ref.nr	3.1.	
	Title	Training sessions for LA-CoNGA Physics	
	Type	<input type="checkbox"/> Teaching material <input type="checkbox"/> Learning material <input type="checkbox"/> Training material	<input checked="" type="checkbox"/> Event <input type="checkbox"/> Report <input type="checkbox"/> Service/Product
	Description	Training sessions for the teaching and technical staff will be organised to learn how to use the e-learning platform, the instrumentation labs and to design and implement MOOCs. Teaching and technical staff will receive high quality training in the latest developments in the field and become well equipped in teaching the updated curricula. They will be able to further share the know - how with their institutions, train other trainers and benefit from the new knowledge in their future professional careers.	
	Due date	The two session will take place in M11-M12 and M23-24 remotely through videoconferences	
	Languages	English and Spanish	
Target groups	<input checked="" type="checkbox"/> Teaching staff <input type="checkbox"/> Students <input type="checkbox"/> Trainees <input checked="" type="checkbox"/> Administrative staff <input checked="" type="checkbox"/> Technical staff <input type="checkbox"/> Librarians <input type="checkbox"/> Other		
	If you selected 'Other', please identify these target groups. (Max. 250 words)		
Dissemination level	<input type="checkbox"/> Department / Faculty <input type="checkbox"/> Local <input type="checkbox"/> National <input type="checkbox"/> Institution <input type="checkbox"/> Regional <input type="checkbox"/> International		

Expected Deliverable/Results/Outcomes	Work Package and Outcome ref.nr	3.2.	
	Title	HEP master/specialization courses for LA-CoNGA Physics	
	Type	<input checked="" type="checkbox"/> Teaching material <input checked="" type="checkbox"/> Learning material <input type="checkbox"/> Training material	<input type="checkbox"/> Event <input type="checkbox"/> Report <input type="checkbox"/> Service/Product
	Description	The course will be online. The master will include three mandatory courses to learn the basic of HEP research (theory, instrumentation and data handling) during the first semester and then during the second semester students will be able to tailor their training with elective courses. Master course materials will be made available via an online extranet available to all partners, students and general public.	
	Due date	The first version starts at M13 and ends in M18 . The second version starts at M25 and ends in M30	

	Languages	During the first semester we will do the courses mostly in Spanish but we will introduce some lectures in English, as it is a very important skill to have in academia and industry. The reason for not doing it in English since the beginning is to be more inclusive. Some students with a low level of English would not enroll in the course.
Target groups	<input type="checkbox"/> Teaching staff <input checked="" type="checkbox"/> Students <input type="checkbox"/> Trainees <input type="checkbox"/> Administrative staff <input type="checkbox"/> Technical staff <input type="checkbox"/> Librarians <input type="checkbox"/> Other	
	<i>If you selected 'Other', please identify these target groups. (Max. 250 words)</i>	
Dissemination level	<input checked="" type="checkbox"/> Department / Faculty <input checked="" type="checkbox"/> Institution	<input checked="" type="checkbox"/> Local <input checked="" type="checkbox"/> Regional <input checked="" type="checkbox"/> National <input checked="" type="checkbox"/> International

Expected Deliverable/Results/Outcomes	Work Package and Outcome ref.nr	3.3.	
	Title	Mobility scheme for students	
	Type	<input type="checkbox"/> Teaching material <input type="checkbox"/> Learning material <input type="checkbox"/> Training material	<input checked="" type="checkbox"/> Event <input checked="" type="checkbox"/> Report <input type="checkbox"/> Service/Product
	Description	LA-CoNGA Physics mobility scheme for students will provide trainee periods at the partnering research institutions, enterprises and SMEs in the EU and Latin American partners in the consortium, including CERN, DESY, IRFU and ICTP. A report should be provided. Academic internship reports and evaluations review provided at the end of the internships.	
	Due date	The two session will take place between M18 and M22 and between M30 and M34. The real period of the internship is 3 months but we allowed two weeks period before and after the internship for preparation of the report.	
	Languages	English or Spanish	
Target groups	<input checked="" type="checkbox"/> Teaching staff <input checked="" type="checkbox"/> Students <input type="checkbox"/> Trainees <input type="checkbox"/> Administrative staff <input type="checkbox"/> Technical staff <input type="checkbox"/> Librarians <input type="checkbox"/> Other		
	<i>If you selected 'Other', please identify these target groups. (Max. 250 words)</i>		
Dissemination level	<input checked="" type="checkbox"/> Department / Faculty <input checked="" type="checkbox"/> Institution	<input checked="" type="checkbox"/> Local <input checked="" type="checkbox"/> Regional	<input checked="" type="checkbox"/> National <input checked="" type="checkbox"/> International

Expected Deliverable/Results/Outcomes	Work Package and Outcome ref.nr	3.4.
	Title	Network schools (NS)

	Type	<input type="checkbox"/> Teaching material <input type="checkbox"/> Learning material <input type="checkbox"/> Training material	<input checked="" type="checkbox"/> Event <input type="checkbox"/> Report <input type="checkbox"/> Service/Product
	Description	Two one-week network schools with mandatory participation of all students will be organised at the end of each one-year program. The students will present the work performed during the internships, and will also attend talks and hands-on sessions provided by experienced teachers from academic and non-academic sectors. The specific lectures provided at schools will be supplemented by activities to discuss scientific dissemination and communication, trainings for CV, interviews and self assessment to give them the tools to get ready for their professional future.	
	Due date	The two sessions will take place in M22 and M34 in Quito, Ecuador and Bucaramanga, Colombia, respectively.	
	Languages	English	
Target groups	<input checked="" type="checkbox"/> Teaching staff <input checked="" type="checkbox"/> Students <input type="checkbox"/> Trainees <input type="checkbox"/> Administrative staff <input type="checkbox"/> Technical staff <input type="checkbox"/> Librarians <input type="checkbox"/> Other		
	<i>If you selected 'Other', please identify these target groups. (Max. 250 words)</i>		
Dissemination level	<input checked="" type="checkbox"/> Department / Faculty <input checked="" type="checkbox"/> Institution	<input checked="" type="checkbox"/> Local <input checked="" type="checkbox"/> Regional	<input checked="" type="checkbox"/> National <input checked="" type="checkbox"/> International

Expected Deliverable/Results/Outcomes	Work Package and Outcome ref.nr	3.5.	
	Title	Master degree award	
	Type	<input type="checkbox"/> Teaching material <input type="checkbox"/> Learning material <input type="checkbox"/> Training material	<input type="checkbox"/> Event <input type="checkbox"/> Report <input checked="" type="checkbox"/> Service/Product
	Description	At the end of their one-year program, students that successfully validated their educative credits (courses, laboratories, internship) will be awarded a master degree award.	
	Due date	The first session of master will end in M22 and the second in M34.	
	Languages	Spanish.	
Target groups	<input type="checkbox"/> Teaching staff <input checked="" type="checkbox"/> Students <input type="checkbox"/> Trainees <input type="checkbox"/> Administrative staff <input type="checkbox"/> Technical staff <input type="checkbox"/> Librarians <input type="checkbox"/> Other		
	<i>If you selected 'Other', please identify these target groups. (Max. 250 words)</i>		
Dissemination level	<input type="checkbox"/> Department / Faculty <input checked="" type="checkbox"/> Institution	<input type="checkbox"/> Local <input type="checkbox"/> Regional	<input type="checkbox"/> National <input type="checkbox"/> International

Work package type and ref.nr	QUALITY PLAN		4
Title	Quality plan		
Related assumptions and risks	R1.1: Partners not complying with planned surveys or complying with delays.		
Description	This WP will comprise detailed activities of evaluation. In order to continuously improve the project and its outcomes during the project lifetime, a number of different evaluation measures will be undertaken.		
Tasks	Task 4.1: Identify the settings for the evaluation: evaluation aims and objectives, evaluators and evaluation participants, evaluation data collection methods, performance of the planned evaluation and data analysis plan. Task 4.2: Implement internal quality assurance through surveys and its corresponding analysis. Task 4.3: Implement and overview external quality assurance of the proposed curricula and the feasibility of its implementation. Task 4.4: Overview and learning agreements and compulsory feedback for mobility activities in WP3. Task 4.5: Assessment of dissemination activities in WP5. Task 4.6: project monitoring and evaluation of WP6.		
Estimated Start Date (dd-mm-yyyy)	M1	Estimated End Date (dd-mm-yyyy)	M36
Lead Organisation	Université Paul Sabatier (UPS) Toulouse		
Participating Organisation	UPS is the leading organisation for WP4. The input of all the partner countries HEIs will be essential to an efficient and effective quality and evaluation plan. The results from the activities of this WP will be discussed frequently in the EBs and AGMs.		
Costs Please explain the necessary costs for this WP: What travels are necessary? If equipment is requested, explain why it is required. If subcontracting is necessary, explain why the task cannot be performed by the partner.	No direct costs associated to the activities in WP4.		

Deliverables/results/outcomes

Expected Deliverable/Results/Outcomes	Work Package and Outcome ref.nr	4.1.	
	Title	Internal Quality Assurance (IQA)	
	Type	<input type="checkbox"/> Teaching material <input type="checkbox"/> Learning material <input type="checkbox"/> Training material	<input type="checkbox"/> Event <input checked="" type="checkbox"/> Report <input type="checkbox"/> Service/Product
	Description	Online questionnaires for current/former students about quality of their training, staff surveys about teaching resources and facilities as well as inquiries towards the associated partners about the performance of the students during the mobility scheme. The feedback between sending/hosting institutions and the staff/students will be compulsory. A full report will be prepared for the EB meetings to be hold every six months. The final report should provide information about the possibilities of expanding the use of e-learning techniques, the instrumentation labs and the mini-modules teaching techniques in other areas at the university; as well as the possibilities of alignment of the HEIs with the EU	

		Bologna system. This final report will be shared and discussed with the HEIs authorities.
	Due date	The evaluation will be constant during the lifetime of the project.
	Languages	English
Target groups	<input checked="" type="checkbox"/> Teaching staff <input checked="" type="checkbox"/> Students <input type="checkbox"/> Trainees <input checked="" type="checkbox"/> Administrative staff <input checked="" type="checkbox"/> Technical staff <input type="checkbox"/> Librarians <input type="checkbox"/> Other	
	<i>If you selected 'Other', please identify these target groups. (Max. 250 words)</i>	
Dissemination level	<input type="checkbox"/> Department / Faculty <input type="checkbox"/> Local <input type="checkbox"/> National <input checked="" type="checkbox"/> Institution <input checked="" type="checkbox"/> Regional <input type="checkbox"/> International	

Expected Deliverable/Results/ Outcomes	Work Package and Outcome ref.nr	4.2.	
	Title	External Quality Assurance (EQA)	
	Type	<input type="checkbox"/> Teaching material <input type="checkbox"/> Learning material <input type="checkbox"/> Training material	<input type="checkbox"/> Event <input checked="" type="checkbox"/> Report <input type="checkbox"/> Service/Product
	Description	These reports will be prepared and will consist of an evaluation of the curricula (M10) and the feasibility of its implementation, of the mobility scheme results (M23 and M34) as well an evaluation of the management (M12, M23, M36). It will be performed by the EAC.	
	Due date	The evaluation will be constant during the lifetime of the project.	
	Languages	English	
Target groups	<input type="checkbox"/> Teaching staff <input type="checkbox"/> Students <input type="checkbox"/> Trainees <input type="checkbox"/> Administrative staff <input type="checkbox"/> Technical staff <input type="checkbox"/> Librarians <input checked="" type="checkbox"/> Other		
	<i>If you selected 'Other', please identify these target groups. (Max. 250 words)</i> The members of the consortium in the form of the Executive Board (EB) and the External Advisory Board (EAB)		
Dissemination level	<input type="checkbox"/> Department / Faculty <input type="checkbox"/> Local <input type="checkbox"/> National <input checked="" type="checkbox"/> Institution <input checked="" type="checkbox"/> Regional <input type="checkbox"/> International		

Work package type and ref.nr	DISSEMINATION & EXPLOITATION	5
Title	Dissemination, awareness and exploitation	
Related assumptions and risks	R5.1: Partners may not deliver input in time resulting in failure to meet the deadline. R5.2: Participating group is unable to deliver. R5.3: Participating group underperforms.	

Description	Internal and external dissemination, proactive public engagement and science education, proper treatment of data and open access, active gender equality promotion, ethical data treatment.		
Tasks	<p>Task 5.1: craft the Communication and Dissemination Plan: identifying the target groups, offline/online media outlets as well as defining the external events where LA-CoNGA Physics will be presented by the partners.</p> <p>Task 5.2: setup official LA-CoNGA Physics website, blogging and social media identities and keep them updated with outreach material for public use and members resources.</p> <p>Task 5.3: organise multidisciplinary outreach events during LA-CoNGA Physics happenings like the annual meetings and NS, identify existing outreach local/regional events and foster LA-CoNGA Physics members participation.</p> <p>Task 5.4: Promotion and organisation of data challenges on data samples obtained from the scientific projects and non academic partners.</p> <p>Task 5.5 : Internal dissemination of results and best practices within the network through AGMs, network meetings, and the restricted area of the LA-CoNGA Physics Website</p> <p>Task 5.6 : External consortium results dissemination to peers through the LA-CoNGA Physics Website and GitHub Repository; promotion of the network role by making sure that LA-CoNGA Physics is properly acknowledged in papers and conference reports.</p> <p>Task 5.7: development of citizen science projects with local schools.</p> <p>Task 5.8: feasibility study to develop Double Master Degrees in HEP between the consortium partners, targeting the HEI staff and administration</p> <p>Task 5.9: define the Sustainability Plan, a serie of long - term actions to promote and maintain the collaboration between the partners, including outlines for future summer schools and a teacher alumni network.</p> <p>Task 5.10: active gender equality promotion and monitoring in outreach activities; training of recruitment panels on gender issues.</p> <p>Task 5.11: Data Management Protection Plan (DMPP) crafting, including Open Access and monitoring of its compliance.</p>		
Estimated Start Date (dd-mm-yyyy)	M1	Estimated End Date (dd-mm-yyyy)	M36
Lead Organisation	UCV and USB		
Participating Organisation	ICTP will organise the data challenges with the input from other associated academic and non-academic partners; UIS and USFQ as hosts of the NS will organise satellite outreach events; but all the partners will ensure participation in regional/local events under the direction of the Venezuelan universities; UIS will guide the implementation of citizen science projects as well as task 5.9 and 5.10; Dresden will lead the gender equality promotion and monitoring in outreach activities will be done together with the Equality, Diversity, Integration Officer as well as the DMPP with inputs from DESY and CERN that have experience in open data and open access; both Dresden and UIS will overview the Communication and Dissemination Plan definition and the initial setup of the LA-CoNGA Physics website, blogging and social media identities.		
Costs <i>Please explain the necessary costs for this WP: What travels are necessary? If equipment is requested, explain why it is required. If subcontracting is necessary, explain why the task cannot be performed by the partner.</i>	<p>The web developer will help us setup the webpage and maintaining it.</p> <p>Citizen science projects and lab demonstrations for high school students will be developed with the equipment that will be bought and that was described in WP2.</p>		

Deliverables/results/outcomes

Expected Deliverable/Results/Outcomes	Work Package and Outcome ref.nr	5.1.			
	Title	Communication and Dissemination Plan			
	Type	<input type="checkbox"/> Teaching material <input type="checkbox"/> Learning material <input type="checkbox"/> Training material	<input type="checkbox"/> Event <input checked="" type="checkbox"/> Report <input type="checkbox"/> Service/Product		
	Description	Detailed dissemination strategy report identifying the target groups, offline/online media outlets as well as defining the external events where LA-CoNGA Physics project can be presented. The objectives of the Communication and Dissemination Plan will be transmitting our educational and scientific advancements to the general public, to high school students and teachers, to other students and communities at the university and to the educative authorities/policy makers at the institutional and national level for them to be fully involved in the cultural growth of society and the modernisation process this project will bring to the partner countries HEIs.			
	Due date	M4			
	Languages	English			
Target groups	<input type="checkbox"/> Teaching staff <input type="checkbox"/> Students <input type="checkbox"/> Trainees <input type="checkbox"/> Administrative staff <input type="checkbox"/> Technical staff <input type="checkbox"/> Librarians <input checked="" type="checkbox"/> Other				
	<i>If you selected 'Other', please identify these target groups.</i> (Max. 250 words) The members of the consortium in the form of the Executive Board (EB) and the External Advisory Board (EAB)				
Dissemination level	<input type="checkbox"/> Department / Faculty <input type="checkbox"/> Local <input type="checkbox"/> National <input type="checkbox"/> Institution <input type="checkbox"/> Regional <input type="checkbox"/> International				

Expected Deliverable/Results/Outcomes	Work Package and Outcome ref.nr	5.2.	
	Title	Sustainability Plan	
	Type	<input type="checkbox"/> Teaching material <input type="checkbox"/> Learning material <input type="checkbox"/> Training material	<input type="checkbox"/> Event <input checked="" type="checkbox"/> Report <input type="checkbox"/> Service/Product
	Description	This report will summarise feasibility study to develop Double Master Degrees in HEP between the consortium partners, targeting the HEI staff and administration. This work is conducted via establishing working groups for bilateral Double Master degree schemes between the partners and developing proposals for Double Master Degrees. Secondly, it will summarise identified long - term actions to promote and maintain the collaboration between the partners including outlines for future summer schools and a teacher alumni network. The sustainability actions will be discussed in AGM3 with the consortium members and relevant external stakeholders at M36.	
	Due date	M36	
	Languages	English	
Target groups	<input type="checkbox"/> Teaching staff <input type="checkbox"/> Students <input type="checkbox"/> Trainees <input type="checkbox"/> Administrative staff		

	<input type="checkbox"/> Technical staff <input type="checkbox"/> Librarians <input checked="" type="checkbox"/> Other <i>If you selected 'Other', please identify these target groups.</i> (Max. 250 words) The members of the consortium in the form of the Executive Board (EB) and the External Advisory Board (EAB)
Dissemination level	<input type="checkbox"/> Department / Faculty <input type="checkbox"/> Local <input type="checkbox"/> National <input type="checkbox"/> Institution <input type="checkbox"/> Regional <input type="checkbox"/> International

Expected Deliverable/Results/Outcomes	Work Package and Outcome ref.nr	5.3.	
	Title	Data Management and Protection Plan	
	Type	<input type="checkbox"/> Teaching material <input type="checkbox"/> Learning material <input type="checkbox"/> Training material	<input type="checkbox"/> Event <input checked="" type="checkbox"/> Report <input type="checkbox"/> Service/Product
	Description	LA-CoNGA Physics will produce data from the instrumentation labs that will be shared among the different partners. Their treatment will follow a Data Management and Protection Plan (DMPP) compiled and signed by all Members in the first year. It will comply with Horizon 2020 FAIR (Findable, Accessible, Interoperable and Reusable) guidelines, maximise Open Access policies and will identify the LA-CoNGA Physics GitHub as reference location for access and preservation, with possible exceptions due to dataset size. Security and privacy aspects will be carefully faced. Collaboration will be sought with agencies promoting Open Access, e.g. CERN Open Data.	
	Due date	M10	
	Languages	English	
Target groups	<input type="checkbox"/> Teaching staff <input type="checkbox"/> Students <input type="checkbox"/> Trainees <input type="checkbox"/> Administrative staff <input type="checkbox"/> Technical staff <input type="checkbox"/> Librarians <input checked="" type="checkbox"/> Other <i>If you selected 'Other', please identify these target groups.</i> (Max. 250 words) The members of the consortium in the form of the Executive Board (EB) and the External Advisory Board (EAB)		
Dissemination level	<input checked="" type="checkbox"/> Department / Faculty <input checked="" type="checkbox"/> Institution	<input type="checkbox"/> Local <input type="checkbox"/> Regional	<input type="checkbox"/> National <input type="checkbox"/> International

Please copy and paste tables as necessary.

Expected Deliverable/Results/Outcomes	Work Package and Outcome ref.nr	5.4.	
	Title	LA-CoNGA Physics Social identities on blogging platforms, instagram, facebook, twitter, pinterest, website	
	Type	<input type="checkbox"/> Teaching material <input type="checkbox"/> Learning material <input type="checkbox"/> Training material	<input type="checkbox"/> Event <input type="checkbox"/> Report <input checked="" type="checkbox"/> Service/Product
	Description	Setup official LA-CoNGA Physics website, blogging and social media identities	

	Due date	M1
	Languages	English and Spanish
Target groups	<input checked="" type="checkbox"/> Teaching staff <input checked="" type="checkbox"/> Students <input type="checkbox"/> Trainees <input checked="" type="checkbox"/> Administrative staff <input checked="" type="checkbox"/> Technical staff <input type="checkbox"/> Librarians <input checked="" type="checkbox"/> Other	
	<i>If you selected 'Other', please identify these target groups. (Max. 250 words)</i> The members of the consortium and the general public	
Dissemination level	<input checked="" type="checkbox"/> Department / Faculty <input checked="" type="checkbox"/> Institution	<input checked="" type="checkbox"/> Local <input checked="" type="checkbox"/> Regional <input checked="" type="checkbox"/> National <input checked="" type="checkbox"/> International

Expected Deliverable/Results/Outcomes	Work Package and Outcome ref.nr	5.5.	
	Title	Outreach activities and citizen science projects	
	Type	<input type="checkbox"/> Teaching material <input type="checkbox"/> Learning material <input type="checkbox"/> Training material	<input checked="" type="checkbox"/> Event <input type="checkbox"/> Report <input type="checkbox"/> Service/Product
	Description	<p>Direct engagement with the different target groups can happen through different activities:</p> <p>General public, policy makers and other communities at the university will be reached through newsletters prepared for social media on our results and gatherings (blogs, instagram, facebook, twitter, pinterest), by participating in existing events (e.g. local Institute Open Days, the International Science Week in Colombia, etc), by producing press releases for newspapers and popular science magazines, by contributing to the Wikipedia content. We will organise outreach activities in our events, including specific activities targeting girls, public debates with people from other fields to discuss the impact of using e-learning techniques in the learning process.</p> <ul style="list-style-type: none"> • School students and teachers will be reached with conferences and keynotes in HEP, instrumentation and data analysis to inspire younger generations to follow their path, for which a database of material will be made available in our website. We will participate in the International Physics Masterclasses¹ and develop citizen science projects for them. • We recognise the importance of addressing policy makers, to communicate them the relevance of modern techniques in the education systems, the importance of fundamental research, the need of international support for multidisciplinary initiatives, and the importance of a tight connection with the industry, also to bring there the abundance of untapped potential of academics specialist knowledge, experience and propensity for hard work. <p>Students, teaching, technical staff and in general members of the consortium should participate in at least one outreach activity per year. All the outreach material will be hosted in the public section of our website. The communication impact will be measured through social media reactions, website access counting, feedback on specific events through questionnaires.</p>	

¹ International Masterclasses hands-on particle physics: <https://physicsmasterclasses.org/>

	Due date	M5-M36
	Languages	English and Spanish
Target groups	<input checked="" type="checkbox"/> Teaching staff <input checked="" type="checkbox"/> Students <input type="checkbox"/> Trainees <input type="checkbox"/> Administrative staff <input checked="" type="checkbox"/> Technical staff <input type="checkbox"/> Librarians <input type="checkbox"/> Other	
	<i>If you selected 'Other', please identify these target groups.</i> (Max. 250 words) The members of the consortium and the general public	
Dissemination level	<input checked="" type="checkbox"/> Department / Faculty <input checked="" type="checkbox"/> Institution	<input checked="" type="checkbox"/> Local <input checked="" type="checkbox"/> Regional <input checked="" type="checkbox"/> National <input checked="" type="checkbox"/> International

Expected Deliverable/Results/Outcomes	Work Package and Outcome ref.nr	5.6.	
	Title	Data challenges	
	Type	<input type="checkbox"/> Teaching material <input type="checkbox"/> Learning material <input type="checkbox"/> Training material	<input type="checkbox"/> Event <input checked="" type="checkbox"/> Report <input type="checkbox"/> Service/Product
	Description	Data challenges are small competitions that will require students to develop new algorithms to solve real problems, either proposed by some of them or by our non academic Partners (e.g. FrontierX). They will happen on the RAMP platform ² that will automatically rank them. The algorithms will be presented by students during the NSs and summarised in one publication. These data challenges to other members at the university too.	
	Due date	M16, M19, M28, M31	
	Languages	English	
Target groups	<input checked="" type="checkbox"/> Teaching staff <input checked="" type="checkbox"/> Students <input type="checkbox"/> Trainees <input type="checkbox"/> Administrative staff <input checked="" type="checkbox"/> Technical staff <input type="checkbox"/> Librarians <input type="checkbox"/> Other		
	<i>If you selected 'Other', please identify these target groups.</i> (Max. 250 words)		
Dissemination level	<input checked="" type="checkbox"/> Department / Faculty <input checked="" type="checkbox"/> Institution	<input checked="" type="checkbox"/> Local <input checked="" type="checkbox"/> Regional	<input checked="" type="checkbox"/> National <input checked="" type="checkbox"/> International

Work package type and ref.nr	MANAGEMENT	6
Title	Management	
Related assumptions and risks	R6.1: Partners not signing the consortium agreement. R6.2: Partners not complying with planned targets resulting in lower performances, less reliable parts. R6.3: Partners may not deliver input in time resulting in failure to meet the deadline.	
Description	Coordinate and manage all activities and financial aspects of LA-CoNGA Physics, interaction with EB and EAB for all matters related to the network, continuously monitor	

² Rapid Analytics and Model Prototyping: <https://www.ramp.studio/>

	the progress of the project including risk management, solve any issues in organisation and implementation.		
Tasks	Task 6.1: Consortium Agreement preparation. Task 6.2: financial administration of the network Task 6.3: internal dissemination monitoring: guarantee that tools and rules for a continuous and transparent sharing and distribution of information and data inside the consortium are established in the Consortium Agreement and followed during the project Task 6.4: Coordination of research and training activities to accomplishment of all milestones and deliverables Task 6.5: Monitoring of the dissemination and communication activities; Task 6.6: coordination of all reports production, and corresponding evaluation Task 6.7: risk monitoring and management with appropriate countermeasures in case of need Task 6.8: communication with different committees		
Estimated Start Date (dd-mm-yyyy)	M1	Estimated End Date (dd-mm-yyyy)	M36
Lead Organisation	Université Paris Diderot with José Ocariz as PI and we will also have a PI from Latin America, Luis Nunez from UIS.		
Participating Organisation	The coordination and management activities will be split in the following tasks, carried out by UPD and UIS with the support of a PM, the Executive Board (EB) for monitoring, WP3, WP4, WP5 lead beneficiaries, and the Equality, Diversity, Integration Officer (EO) when appropriate.		
Costs <i>Please explain the necessary costs for this WP: What travels are necessary? If equipment is requested, explain why it is required. If subcontracting is necessary, explain why the task cannot be performed by the partner.</i>	The budget will be used for the organisation, trip and living costs for the KM and the three AGMs. The EB meetings and other meetings happening between AGMs will be virtual meetings, so not additional costs. The specific details are included in the budget plan.		

Deliverables/results/outcomes

Expected Deliverable/Results/ Outcomes	Work Package and Outcome ref.nr	6.1.	
	Title	Consortium Agreement signature	
	Type	<input type="checkbox"/> Teaching material <input type="checkbox"/> Learning material <input type="checkbox"/> Training material	X Event X Report <input type="checkbox"/> Service/Product
	Description	Kickoff meeting and signed agreement from all partners in Bogotá, Colombia	
	Due date	M1	
	Languages	English	
Target groups	<input type="checkbox"/> Teaching staff <input type="checkbox"/> Students <input type="checkbox"/> Trainees <input type="checkbox"/> Administrative staff <input type="checkbox"/> Technical staff <input type="checkbox"/> Librarians		

	<input checked="" type="checkbox"/> Other <i>If you selected 'Other', please identify these target groups. (Max. 250 words)</i> PI, co-PI and partner representatives		
Dissemination level	<input type="checkbox"/> Department / Faculty <input checked="" type="checkbox"/> Institution	<input type="checkbox"/> Local <input type="checkbox"/> Regional	<input type="checkbox"/> National <input type="checkbox"/> International

Expected Deliverable/Results/Outcomes	Work Package and Outcome ref.nr	6.2.	
	Title	Project manager PM nomination	
	Type	<input type="checkbox"/> Teaching material <input type="checkbox"/> Learning material <input type="checkbox"/> Training material	<input type="checkbox"/> Event <input type="checkbox"/> Report <input type="checkbox"/> Service/Product
	Description	The PI will be supported by a Project Manager (PM), to be identified and contracted in case of funding of the project. With the support of the PM, the PI will ensure: distributing the funds to the partners; regularly reviewing the network finances; collecting all the necessary financial information; preparing audit certificates where required; preparing the Consortium Agreement (CA), monitoring and ensuring that it will be respected; advising and leading the partners on all developments related to the project execution; ensuring the effective exchange of information within the project; organizing the supervisory board meetings, the KM and AGMs; overseeing the efficient implementation of all the activities of the network; monitoring the progress and the timely achievement of the deliverables; monitoring the risks. The PI will report to the EAC, composed of world-level experts in the domains of interest for LA-CoNGA Physics	
	Due date	M1	
	Languages	Does not apply	
Target groups	<input type="checkbox"/> Teaching staff <input type="checkbox"/> Students <input type="checkbox"/> Trainees <input type="checkbox"/> Administrative staff <input type="checkbox"/> Technical staff <input type="checkbox"/> Librarians <input type="checkbox"/> Other		
	<i>If you selected 'Other', please identify these target groups. (Max. 250 words)</i>		
Dissemination level	<input type="checkbox"/> Department / Faculty <input checked="" type="checkbox"/> Institution	<input checked="" type="checkbox"/> Local <input checked="" type="checkbox"/> Regional	<input type="checkbox"/> National <input type="checkbox"/> International

Expected Deliverable/Results/Outcomes	Work Package and Outcome ref.nr	6.3.	
	Title	Institution of risk registry	
	Type	<input type="checkbox"/> Teaching material <input type="checkbox"/> Learning material <input type="checkbox"/> Training material	<input type="checkbox"/> Event <input checked="" type="checkbox"/> Report <input type="checkbox"/> Service/Product
	Description	Risks will be monitored in a risk registry by the PIs. The registry will be reviewed and updated at each EB meeting, to put in place preventive mitigation measures whenever needed.	
	Due date	M1	

	Languages	English
Target groups	<input type="checkbox"/> Teaching staff <input type="checkbox"/> Students <input type="checkbox"/> Trainees <input type="checkbox"/> Administrative staff <input type="checkbox"/> Technical staff <input type="checkbox"/> Librarians <input type="checkbox"/> Other	
	<i>If you selected 'Other', please identify these target groups. (Max. 250 words)</i>	
Dissemination level	<input type="checkbox"/> Department / Faculty <input type="checkbox"/> Institution	<input type="checkbox"/> Local <input type="checkbox"/> Regional <input type="checkbox"/> National <input type="checkbox"/> International

Expected Deliverable/Results/Outcomes	Work Package and Outcome ref.nr	6.4.	
	Title	Financial and general status report at each AGM and EB meeting if pertinent	
	Type	<input type="checkbox"/> Teaching material <input type="checkbox"/> Learning material <input type="checkbox"/> Training material	<input type="checkbox"/> Event <input checked="" type="checkbox"/> Report <input type="checkbox"/> Service/Product
	Description	Financial and general status report at each AGM and EB meeting if pertinent	
	Due date	The AGMs will take place at M12, M23, M36. The AGMs will be in Lima, Peru; Quito, Ecuador and Paris, France, respectively. EB meetings will be every six months and therefore some of them coincide with the AGMs and other will be held in between and they will be by videoconference	
	Languages	English	
Target groups	<input type="checkbox"/> Teaching staff <input type="checkbox"/> Students <input type="checkbox"/> Trainees <input type="checkbox"/> Administrative staff <input type="checkbox"/> Technical staff <input type="checkbox"/> Librarians <input type="checkbox"/> Other		
	<i>If you selected 'Other', please identify these target groups. (Max. 250 words)</i>		
Dissemination level	<input type="checkbox"/> Department / Faculty <input type="checkbox"/> Institution	<input type="checkbox"/> Local <input type="checkbox"/> Regional <input type="checkbox"/> National <input type="checkbox"/> International	

Expected Deliverable/Results/Outcomes	Work Package and Outcome ref.nr	6.5.	
	Title	Final report during last AGM	
	Type	<input type="checkbox"/> Teaching material <input type="checkbox"/> Learning material <input type="checkbox"/> Training material	<input type="checkbox"/> Event <input checked="" type="checkbox"/> Report <input type="checkbox"/> Service/Product
	Description	Final report during Closing Network Meeting	
	Due date	M36	
	Languages	English and Spanish	
Target groups	<input type="checkbox"/> Teaching staff <input type="checkbox"/> Students		

Please complete the following Logical Framework Matrix:

E.7 Consortium partners involved and human resources required to complete the work packages

Indicative input of consortium staff - The total number of days per staff category should correspond with the information provided in the budget tables.

Work Package Ref.nr	Part ner nr	Partner acronym	Country	Number of staff days ¹					Exact Role and tasks of each person in the work package
				Category 1	Category 2	Category 3	Category 4	Total	
	P1	UPD	France		10			10	JO and RC (from affiliated partner CNRS) will provide the information required by the WP leader and help writing the report
	P2	UIS	Colombia		4			4	All members will provide the information required by the WP leader
	P3	UAN	Colombia		16			16	All members will provide the information required by the WP leader. CS will help writing the report
	P4	USFQ	Ecuador		4			4	All members will provide the information required by the WP leader
	P5	YACHAY	Ecuador		4			4	All members will provide the information required by the WP leader
PREPARATION	P6	UNMSM	Peru	8	12			20	TV will lead this WP and also write the report
	P7	UNI	Peru		4			4	All members will provide the information required by the WP leader
	P8	UCV	Venezuela		4			4	All members will provide the information required by the WP leader

¹ Please see Programme Guide, Part B for your action, Table A – Project Implementation (amounts in Euro per day) Programme Countries and Table B - Project Implementation (amounts in Euro per day) Partner Countries.

	P9	USB	Venezuela		4			4	All members will provide the information required by the WP leader
SUBTOTAL				8	62			70	
	P1	UPD	France		40			40	JO, RC, MB will participate in the development of the online courses. JO and RC will teach. MB will his expertise regarding the connected instrumentation labs
	P2	UIS	Colombia		70			70	LAN will participate in the development of the online courses and teach. Will host a network school
	P3	UAN	Colombia	40	70			110	CS and GN will teach. CS will be one of the leaders of the WP and will organise the courses and the creation of the e-learning platform
	P4	USFQ	Ecuador	15	90			105	DC will be the other leader of the WP. DC and EC will organise the installation and setup of the instrumentation labs. Will host a network school
	P5	YACHAY	Ecuador		40			40	EM will develop the advanced theoretical physics course
DEVELOPMENT	P6	UNMSM	Peru		70			70	TV will participate in the development of the online courses and teach. Will host a AGM
	P7	UNI	Peru		70			70	JS will participate in the development of the online courses and teach. Will host a AGM
	P8	UCV	Venezuela		70			70	JAL and AF will participate in the development of the online courses and teach
	P9	USB	Venezuela		70			70	JS will participate in the development of the online courses and teach
	P10	UPS	France		30			30	PP will develop the advanced theoretical physics course
	P11	TUD	Germany		30			30	JM will steer the consistency of the HEP courses, and teach.
SUBTOTAL				55	650			705	
	P1	UPD	France		10			10	All members will provide the information required by the WP leader

	P2	UIS	Colombia		10			10	All members will provide the information required by the WP leader
	P3	UAN	Colombia		10			10	All members will provide the information required by the WP leader
	P4	USFQ	Ecuador		10			10	All members will provide the information required by the WP leader
	P5	YACHAY	Ecuador		20			20	All members will provide the information required by the WP leader and help with the report and quality plan presentations
QUALITY PLAN	P6	UNMSM	Peru		10			10	All members will provide the information required by the WP leader
	P7	UNI	Peru		10			10	All members will provide the information required by the WP leader
	P8	UCV	Venezuela		10			10	All members will provide the information required by the WP leader
	P9	USB	Venezuela		10			10	All members will provide the information required by the WP leader
	P10	UPS	France	30	0			30	PP will be the leader of this WP
	P11	TUD	Germany		5			5	All members will provide the information required by the WP leader
SUBTOTAL				30	105			135	
	P1	UPD	France		35			35	All members will participate in the outreach, citizen sciences, school networks
	P2	UIS	Colombia		15			15	all the partners will ensure participation in regional/local events. UIS will guide the implementation of citizen science projects as well as task 5.9 and 5.10
	P3	UAN	Colombia		15			15	All the partners will ensure participation in regional/local events.
	P4	USFQ	Ecuador		15			15	all the partners will ensure participation in regional/local events
	P5	YACHAY	Ecuador		15			15	all the partners will ensure participation in regional/local events. Will lead the creation of the Sustainability Plan.

	P6	UNMSM	Peru		15			15	all the partners will ensure participation in regional/local events
	P7	UNI	Peru		15			15	all the partners will ensure participation in regional/local events
DISSEMINATION & EXPLOITATION	P8	UCV	Venezuela	10	15			25	JAL will be one of the coordinators of this WP. Lead the open data and open access activities, with the help of CERN and DESY
	P9	USB	Venezuela	10	15			25	JS will be one of the coordinators of this WP. Will overview the Communication and Dissemination Plan definition
	P10	UPS	France		15			15	all the partners will ensure participation in regional/local events
	P11	TUD	Germany		30			30	TUD will lead the gender equality promotion and monitoring and will provide his expertise in outreach
SUBTOTAL				20	200			220	
MANAGEMENT	P1	UPD	France	500				500	JO is the project PI, and will work in close coordination with the Program Manager (PM). Will host last AGM of the project
	P2	UIS	Colombia	80				80	LAN is the co-PI of the project. He will work in close coordination with the PI and the PM.
SUBTOTAL				580				580	
TOTAL				693	1017			1710	

PART F – Quality of the Project Team and Cooperation Arrangements

F.1 Background of partnership and the proposal preparation

Please provide shortly the history of cooperation between partners (if any). How the idea of the project was developed and which/ who among partners contributed to the proposal development. (limit 3.000 characters)

Close and effective cooperation among large networks of institutions is a well-established tradition in HEP. LA-CoNGA Physics proposes to build a common capacity among the eight partner countries HEIs, inspired on the HEP cooperative tradition as a tool to ensure sustainability, and taking advantage of the already-existing cooperation among program and partner institutions:

- UCV, UAN, UPD, CNRS, CERN, IRFU, DESY participated in the High Energy Physics Latinamerican-European Network (HELEN) founded by the Europaid Alfa program (finished in 2009). The impact of the HELEN program in the landscape of experimental HEP in Latin America has been very largely recognised.
- Several staff from UCV, USB, USFQ, UNI have a scientific activity at CERN or ICTP. These institutions have expressed a strong interest in hosting internships and leverage their networks for the level of the courses.
- USFQ is member of CMS, and UAN is member of ATLAS, both being international collaborations at the Large Hadron Collider LHC at CERN; ensuring the effectiveness of secondments/internships from this proposal.
- UIS, UCV, USB are members of the Large Aperture Gamma Ray Observatory (LAGO) collaboration, an original example of scientific collaboration among partner institutes

Other cooperation between the partners also exist at individual level, for example professor visits. Connections already exist also between some of the academic and the industrial members that have expressed their support for this initiative. For instance, several of the non-academic contacts have a background in science with PhD in HEP or ML and previous working experience in research, with existing network links with several academic institutions in the consortium. All the partner country HEIs are part of redCLARA. DBaccess collaborated in the past with Venezuelan universities. CAEN already collaborates with USFQ for instrumentation training. UIS and UAN already collaborates with UCAC.

As a general rule, the Latin American experimental HEP community has been building on since at least some 15 years. In countries like Brazil, Mexico, Argentina these communities are by now solidly established, both at the teaching and research levels. The situation is slightly less advanced in other countries, like the ones involved in this LA-CoNGA Physics proposal. With that in mind, several members of the LA-CoNGA Physics team have carried out small scale studies and feasibility analyses through a virtual research and learning community called CEVALE2VE (Centro Virtual de Altos Estudios de Altas Energías in Spanish). CEVALE2VE has officially included a 60 hour virtual course "Introduction to HEP" developed for master and Ph.D. students in several of the target HEIs: Universidad Central de Venezuela (UCV), the Universidad Simon Bolivar (USB), Universidad Industrial de Santander (UIS) and the Universidad Antonio Narino (UAN)- and Peru -Universidad Nacional Mayor de San Marcos (UNMSM).

The CEVALE2VE experience evidenced several challenges: the poor Internet bandwidth and service quality stood out in Venezuela; although good instructor-student relationships quickly

developed but during the final research experience the progress was slow due to the virtual relation and the time differences; practical instrumentation experience missing and lack of an e-learning platform that could be used for the courses. Starting from initial experience, we decided to foster a one-year master/specialisation program --following the European Union (EU) Bologna model-- to provide the students with cutting-edge technological competencies in electronics and data analysis, through a flexible curricular design with entrepreneurship elements in order to promote also non-academic employment opportunities.

If relevant, please explain how and to which extent the project benefits from the experience and participation of non-academic partners. (limit 3.000 characters)

High Energy Physics research catalyses state-of-the-art technological developments, yielding many practical outcomes in electronics, information technologies, open-access collaborative tools, and collective working methodologies. We will profit from this particularity to develop skills in which foster possible employment outside the academic world.

If funded, the LA-CoNGA Physics proposal will benefit directly the target HEIs, not only through the support from the European partners. It will also provide a wider range benefit, through the academic impact of building capacity, since the tools to be developed will be used both for academic purposes in other subjects of the target HEIs curricular offer, and the societal impact at large, through the citizen science projects included in this proposal.

The program will be built through a unique collaborative virtual research and learning communities (VRLC) concept in a network of: universities, HEP research centres and data science/IT companies, providing the students with cutting-edge technological competencies in electronics and data analysis, through a flexible curricular design with entrepreneurship elements to promote non-academic employment opportunities. We will offer internships to the students in high-level international research centres like CERN, ICTP, DESY and IRFU, and data science companies --FrontierX Analytics in Colombia and DBAccess in Peru-- and through the implementation of citizen science activities in schools close to the universities.

FrontierX Analytics (<http://frontierx.co>) is a Colombian startup of Data analytics developed on cloud services on customer premises. Most of the techniques that will teach our students could be extended non-academic areas. FrontierX will help to illustrate this link.

DBAccess (<http://www.dbaccess.com>) is an IT company with more than 15 years of experience and several offices in Latin-America. In addition to its core IT business This company is very involved in promoting IT startups and young entrepreneurship.

RedCLARA (for its acronym in Spanish of Latin America Cooperation of Advanced Academic network <https://www.redclara.net>) is a multilateral organisation of the Latin-american countries similar to GEANT in EU, which promotes the development of IT infrastructure in the academic environment. CLARA gathers more than 1000 universities in Latin America. For the LA-CoNGA Physics project will guarantee high speed and reliable connectivity among the LA university partners and with the EU universities and research centers, providing the primary/initial cooperative IT infrastructure called Colaboratorio (video-conference tool, video repositories).

CAEN is the only company in the world providing instrumentation equipments which meet IEEE Standards for Nuclear and Particle Physics. CAEN will provide expert support and training during the design and installation of the instrumentation labs in each HEI.

It is also important for LA-CoNGA Physics that its members and students received transferable skills training dedicated to the preparation for their future career, both academic and nonacademic and these will be organised together by the New York Academy of Sciences and the ACAC (to ensure the knowledge transfer to the region and the sustainability of the project). Through its Science Alliance program the NYAS offers online workshops on effective grant-writing, securing research funding, communications & career planning; leadership online training and networking with contacts and opportunities outside academia.

Please explain the role and the participation of the Programme Country partners and their support in the development of the different activities (e.g. in the development of the curricula) and (limit 3.000 characters)

The programme country partners will accompany the partner country partners in the development of the project. They will overview the project from the management and quality assurance point of view, ensuring also the skills and knowledge transfer to guarantee the sustainability of the LA-CoNGA Physics activities once the 3 years of the project are over. The laboratory instruments and the courses will of course remain available after the project is over.

Université Paris Diderot (with CNRS as affiliated partner) and TUD are universities with a long tradition in high energy physics. The staff from Paris Diderot-CNRS work at the Laboratoire de physique nucléaire et de hautes énergies (LPNHE) and are part of the ATLAS experiment at the Large Hadron Collider at CERN. LPNHE is involved in several major experimental programs covering research in particle physics, astroparticles, and cosmology and their support to the ICT development and HEP development in Latin America is evidenced by its participations in efforts as HELEN. In addition to participating in several major experimental HEP programs and having a main contribution on the HEP theoretical and phenomenology side, also actively lead outreach HEP programs through its education group TUD. TUD yearly lead two global HEP outreach programs: Netzwerk Teilchenwelt in Germany (Network particle world <https://www.teilchenwelt.de/>) and the International Masterclasses-hands on particle physics (<https://physicsmasterclasses.org/>). Staff from TUD and LPNHE have participated in the CEVALE2VE experience.

On the other hand UPS has a long tradition in physics. In particular the staff from UPS involved in the project has expertise in statistical physics, a key component of the curricula program we want to develop within LA-CoNGA Physics. Staff from UPS have a strong experience in quality assurance of big projects, having held high profile positions at the Conseil National des Universités and the Société Française de Physique in France.

F.2 Cooperation arrangements, management and communication

Please define the organisation of the implementation of the project and the division of tasks between the partners. Please explain the allocation of resources for each activity. Explain also how the tasks are distributed amongst the partners and how project "ownership" is ensured (limit 3.000 characters).

The program will be run in the framework of collaborative virtual research and learning communities (VRLC). All LA-CoNGA Physics members bring to the network the necessary elements to achieve technical, training and educational goals. All members are fully committed to the success of the actions, through sharing responsibilities as described in E.6. Paris Diderot PI will lead the WP management together with his co-PI from UIS to ensure knowledge and skill transfer to the LA partner institutions. UAN and UNMSM will lead the preparation package whose main deliverable will be a report summarising the revised curricula, teaching methodologies and equipment needed in each partner country HEI for the development of the

project. Based on the results from WP1, the development of the ICT and e-learning platform as well as installation/calibration/setup of the instrumentation labs will happen between M5 and M9 leaded by the USB/UCV and the USFQ/UNI, respectively. A key part of this WP2 will be to provide the information necessary to train the local teaching and technical staff to used them.

WP3 will also start around M5 and following the recommendation from WP1 this WP is devoted to the training and educational part of LA-CoNGA Physics. The program will create a modern and flexible one year master in HEP at the partnering HEIs under the leadership of UAN. Will be one program but with the participation of the students from the eight universities. The students will work, through the IT platform, in groups made from different institutions. They will share different technology for the experimental setup. The Ecuadorian and Colombian Universities have more experience in instrumentation and Data processing and will share this with the less skilled institutions of Perú and Venezuela. A mobility scheme will be implemented with the support of the academic and non academic associated partners. WP4, leaded by UPS, will comprise detailed activities of evaluation to ensure highly effective and efficient use of time and resources. The dissemination, exploitation of results and sustainability plan will be leaded by the Venezuelan HEIs with strong support from TUD and UIS. The kickoff meeting will be hosted by UAN, while the three annual meetings will be hosted by Lima, Quito and Paris.

All Members, including associated partners, will collaborate in terms of dissemination, exploitation and sustainability of the project, both locally and regionally. All the members play a key role in the implementation of the project, with well-defined responsibilities and tasks and this will ensure ownership of LA-CoNGA Physics. The role of the programme partners will be to accompany these eight institutions, make sure that they acquire the needed skills and to built a self-sustained VRLC with meaningful cross-country and European connections.

Around 25% of the budget will be used for staff costs, 30% will be used to cover the costs of the development of the e-learning platform and the instrumentation labs, 30% will be used for the mobility scheme and the remaining 15% will be used for the consortium annual meetings and the two network schools.

Please explain the overall project and partnership management making specific reference to the management plan and how decisions will be taken. Please describe how permanent and effective communication and reporting will be ensured as well as the measures put in place for conflict resolution (limit 2.000 characters).

The management structure of LA-CoNGA Physics is shown in the figure 5. The **PI**, José Ocariz (senior professor at Université Paris Diderot) carries the responsibility of overall coordination and management, quality management and financial-legal aspects, under the guidance of Paris Diderot Finance and Legal Department/Bureau des Relations Internationales. To **guarantee the sustainability of the project, the Co-PI**, Luis A. Núñez (Univ. Industrial de Santander), shares the responsibility to knowledge and skill transfer to the Latin-american partner institutions (academic and non-academic).

The PI has a long experience in creating and managing international cooperation programs, both at the academic and research levels. He was the national interlocutor for France for the HELEN (High Energy Physics Latin-American-European Network <http://www.roma1.infn.it/exp/helen/>) and EPLANET (European Particle physics Latin American NETwork <https://cordis.europa.eu/project/rcn/97759/reporting/en>) programs (he was also member of the Executive Board in both programs), he has led or participated in several binational cooperation

programs between France and Latin-American countries (Venezuela, Argentina, Brasil). Over the last 15 years, he has actively helped students from Venezuela to prepare a Ph.D. in experimental HEP in France; this core team of young Venezuelan researchers in HEP are the founders of the CEVALE2VE program. He was for ten years the responsible at Paris Diderot of the NPAC Master (nuclei, particles, astroparticles, cosmology), the main Master-level program in HEP in the Paris area.

Presently the Co-PI is the dean of graduates studies at School of Physics at Universidad Industrial de Santander Colombia and has more than 15 years of experience participating in EU-LA projects, several of them in close cooperation with the PI. He was the interlocutor (and also member of the Executive Board) for Venezuela in HELEN Program. He was country representative for EU-LA projects: E-infrastructure shared between Europe and Latin America (EELA <https://cordis.europa.eu/project/rcn/80129/factsheet/en>); E-Science Grid Facility for Europe and Latin America (EELA-2 <https://cordis.europa.eu/project/rcn/86622/factsheet/en>) and Latinamerican representative for Grid Initiatives for e-Science virtual communities in Europe and Latin America (GISELA <https://cordis.europa.eu/project/rcn/95836/factsheet/en>), Co-ordination and Harmonisation of Advanced e-INFRASTRUCTURES (CHAIN <https://cordis.europa.eu/project/rcn/95925/factsheet/en>) and Coordination and Harmonisation of Advanced e-INFRASTRUCTURES for Research and Education Data Sharing (CHAIN-REDS <https://cordis.europa.eu/project/rcn/104593/factsheet/es>).

In case this proposal is funded, the PI and Co-PI will be supported by a **Project Manager (PM)**, to be identified, hired, and based in Paris. With the support of the PM, the PI & Co-PI will ensure: preparing the Consortium Agreement (CA), monitoring and ensuring that it will be respected; advising and leading the partners on all developments related to the project execution; distributing the funds to the partners; regularly reviewing the network finances; collecting all the necessary financial information; preparing audit certificates where required; ensuring the effective exchange of information within the project; organizing the supervisory board meetings, the kick-off and AGMs; overseeing the efficient implementation of all the activities of the network; monitoring the progress and the timely achievement of the deliverables; monitoring the risks. **The PI will report to the External Advisory Board (EAB)**, composed of world-level experts in the domains of interest of the project. The EAB will be appointed by the leading external partners' institutions choosing staff with experience in capacity building and management of complex projects in HEP, and with good knowledge of the HEP landscape in Latin America. There will be a designated Equality, Diversity and Integration Officer (EO) that will ensure the diversity in the LA-CoNGA Physics activities.

The **decisional body is the Executive Board (EB)**. Members of the EB are the PI and Co-PI, the PM, one representative for each partner (both beneficiaries and associated) and WP leaders. The PI chairs the EB. Any suggested or required changes in the programme (for example, travel internships) will have to be approved by the EB. Where such changes may have an impact on the contractual obligations of the project, the prior agreement of the EC Project Officer in charge will be sought. The gender balance will be insured at the level of decision-making within the project. The PI and co-PI calls the EB meetings. Meetings with representative from the beneficiary institutes will be held frequently (at a typical six-week rate), while plenary EB meetings, including representatives from the associated partners will be called with a lesser frequency, typically every six months or whenever it is deemed to be necessary. To ensure the effectiveness of the exchange program and the optimal choice of exchanges, the EB will evaluate every year the development of the work packages and the choice of the students/staff that would benefit from the exchanges. The EB will actively develop ways to sustain cooperation among Beneficiaries and Partners also after the life of the project and to enlarge the interest in the project to other actors.

Work Package Coordinators are selected among the partners according to their expertises and implication in the WP tasks. WP Coordinators will report regularly to the PI and co-PI on the development of the research program, produce the required reports in advance of milestones and deliverables, and circulate them for discussion in the relevant EB meetings.

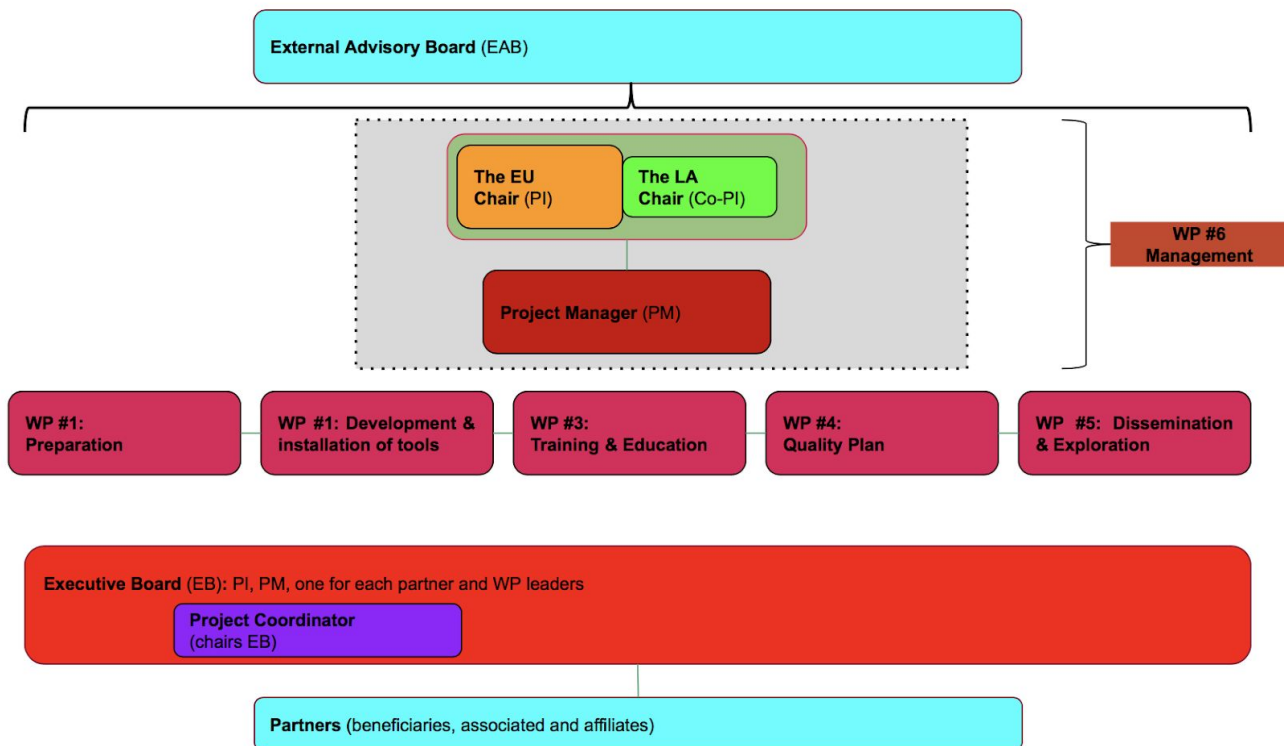


Figure 5. Management structure of LA-CoNGA Physics

F.3 Organisations and activities

This part must be completed separately by each organisation participating in the project (applicant and partners with its affiliated entities (if any)).

Partner number ☒		P1
Organisation name & acronym	Université Paris Diderot	
F.3.1 - Aims and activities of the organisation <i>Please provide a short presentation of your organisation (key activities, affiliations, size of the organisation, etc.) relating to the area covered by the project (limit 2000 characters).</i>		
Situated in the heart of Paris, Université Paris Diderot is the only multidisciplinary university in Paris to offer a wide range of degrees in the Humanities, Medicine and the Sciences. With its 29,000 students, 20% of whom are international, its 2,000 faculties and its 92 research laboratories, it is a major actor in European higher education and research. According to its own tradition and humanist principles set out by eighteenth-century encyclopaedist Denis Diderot, the university's ambition is to enlighten 21st-century society by opening up new fields of study, renewing traditional disciplines, developing and enhancing the achievements and results of research, and connecting with the community at large. The University has acquired an international reputation for the excellence of its standards of research in all the		

fields in which it is active, namely science, medicine, dentistry, art and humanities and social sciences. The University has located its central administration and most of its departments in a newly developing area of Paris – known as Paris Rive Gauche – a few streets south east of the Bibliothèque Nationale de France. Former industrial buildings have been rehabilitated, thus preserving an important link with the history of Paris, while brand new ones have also been commissioned from world-class architects.

Since April 2009, Université Paris Diderot has been part of Sorbonne Paris Cité, a consortium of four universities and four leading French academic institutions. It aims to raise their effectiveness and attractiveness and foster international partnerships.

Only for Partner Country institutions, please provide information on:

Number of Memoranda of Cooperation/Understanding the HEI has signed with HEIs outside their own country?	270 currently active
Number of students	28918
Number of Bachelor degrees offered	34
Number of Master degrees offered	39
Number of PhD degrees offered	77
Have you participated in CBHE? If yes, list CBHE projects titles and reference numbers. Describe curricular/ courses developed/ modernised, if any (name of the subject area and courses titles)	No.

F.3.2 – Role of your organisation in the project

Please describe also the role of your organisation in the project (limit 1000 characters).

The academic offer at Université Paris Diderot includes NPAC (nuclei, particles, astroparticles, cosmology), the main Master-level program in HEP in the Paris area, organised together with Sorbonne Université, Université Paris-Saclay and CEA-Saclay.

Through its research and academic staff, Paris Diderot provides a significant expertise in all aspects of Master-level HEP teaching (organisation, courses, student training and internships, career advisorship).

The laboratory LPNHE (Laboratoire de Physique Nucléaire et des Hautes Energies) is affiliated to Paris Diderot University, and to CNRS-IN2P3 (Institut National de Physique Nucléaire et Physique des Particules) and Sorbonne Université.

The Paris Diderot Physics Department will be in charge of most administrative responsibilities related to this project.

F.3.3 – Curriculum development project (only for Partner Country institutions)

Please fill in if you are applying for a curriculum development project

Please confirm that no similar curricula/ courses/modules were developed/modernised in Tempus IV projects in this HEI.

Choose an item.

For new courses

What new courses will the project implement in your HEI?

For each course please fill the following nested table:

Title	
Level of study	

List of subjects and credits (ECTS or comparable credit system) for each of them	
Estimated date of accreditation and accreditation body	
Estimated starting date of the new programme	
Number of students to be accepted in the first year/ second year	
Number of teaching staff to be trained	
Internship /placements (if applicable)	
List of equipment to be purchased for this course? (if applicable)	

Please copy and paste nested tables as necessary

For updated courses

Which existing courses will be updated in your HEI?

For each course please fill the following nested table:

Title	
Level of study	
List of subjects and credits (ECTS or comparable credit system) for each of them	
Estimated date of accreditation and accreditation body	
% of the modernised subjects compared to total subjects included in the course	
Number of students to be accepted in the first year/ second year	
Number of teaching staff to be trained	
Internship /placements (if applicable)	
List of equipment to be purchased for this course? (if applicable)	

Please copy and paste nested tables as necessary

F.3.4 – Modernisation of governance, management and functioning of HEIs (only for Partner Country institutions)
Please fill in if you are applying for this type of project and define clear the activities to be held in your institution
 (limit 2000 characters)

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Provide information on (if applicable)

Is the centre to be created a new one or an update?	
If new, why is a new centre necessary? If updated, why is an updated centre necessary?	
Where will the centre be located in the institution?	

Will this infrastructure be made available to the centre after the project ends?	
How many people will be employed in the centre?	
Will the institution fund these posts after the project ends?	
How many administrative staff will be trained?	
Which procedures will be updated /introduced in the institution?	
F.3.5 – Strengthening of relations between HEIs and the wider economic and social environment (only for Partner Country institutions) <i>Please fill in if you are applying for this type of project and define clear the activities to be held in your institution (limit 2000 characters)</i>	
F.3.6 – Expected results and impact (only for Partner Country institutions)	
What are the expected tangible results from the project in your HEI?	
How will the impact of these results be measured in your HEI?	
What financial means and human and other resources will be provided to sustain these results after the project ends?	
F.3.7 - Operational capacity: Skills and expertise of key staff involved in the project <i>Please add lines as necessary.</i>	
Name of staff member	Summary of relevant skills and experience, including where relevant a list of recent publications related to the domain of the project.
José Ocariz (JO)	<p>José Ocariz, the PI of this project, is senior professor at Paris Diderot University, and researcher in experimental HEP at LPNHE.</p> <p>He has been member of the NA48, LHCb, BaBar and CkmFitter collaborations. He is since 2009 member of the ATLAS experiment.</p> <p>He was responsible at Paris Diderot of the NPAC Master from 2009 to 2018.</p> <p>He has been teaching Master-level courses on nuclear and particle physics for several years.</p> <p>He has a long experience in creating and managing international cooperation programs, both at the academic and research levels: he was the national interlocutor for France of the HELEN (2005-2009) and EPLANET (2011-2015) programs; he has led or participated in several binational cooperation programs between France and Latin-american countries (Venezuela, Argentina, Brasil); over the last 15 years, he has actively mentored several students from Venezuela that prepared a PhD in experimental HEP in France, and several of them are now active members of CEVALE2VE and in this LA-CoNGA Physics proposal.</p> <p>List of publications: http://inspirehep.net/search?ln=en&ln=en&p=find+a+ocariz&of=hcs&action_search=Search&sf=earliestdate&so=d&rm=&rg=25&sc=0 </p>
Marco Bomben (MB)	<p>MB is assistant professor (Maître de Conférences) at Paris Diderot University.</p> <p>After a PhD thesis in the BaBar experiment, he joined the ATLAS experiment in 2010.</p> <p>An instrumentation-oriented particle physicist, his main expertise is on the research</p>

	<p>and development of silicon detectors for HEP. He is coordinator of test-beam programs in the ITk project to upgrade the ATLAS detector for its future high-luminosity data-taking period.</p> <p>In NPAC, he teaches Master-level laboratory courses in nuclear physics.</p> <p>List of publications: http://inspirehep.net/search?ln=en&ln=en&p=find+a+bomben&of=hcs&action_search=Search&sf=earliestdate&so=d&rm=&rg=25&sc=0</p>
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Partner number ☒		P2
Organisation name & acronym	Universidad Industrial de Santander (UIS)	
<p>F.3.1 - Aims and activities of the organisation <i>Please provide a short presentation of your organisation (key activities, affiliations, size of the organisation, etc.) relating to the area covered by the project (limit 2000 characters).</i></p> <p>Universidad Industrial de Santander (UIS) is the highest ranked University in northeastern Colombia, with a high quality certification given by the National Education Ministry in 2005, and renewed in 2014 for a period of eight years.</p> <p>Founded in 1948 in Bucaramanga, Santander in order to satisfy the needs in the region to forming high level engineers for the oil industry, UIS is currently one of the four most important public universities in Colombia.</p> <p>Today, UIS main mission remains on the formation of professionals (around 22,000 undergraduate and graduate students) at the highest level in most of the areas of knowledge (Physic-chemical and Physic-mechanical engineering, Basic Sciences, Human Sciences, Health and Life Sciences).</p> <p>Physically, it is divided into four sites in Bucaramanga and four additional sites in mid-sized cities of the region (Barrancabermeja, Barbosa, Socorro and Malaga). UIS offers a total of 44 undergraduate and 113 postgraduate degrees, including 50 Masters and 10 PhD programs, among its five faculties.</p> <p>Besides, within its projects UIS has The Technological Park of Guatiguará (PTG) located in the south of Bucaramanga which is today the most advanced urban, technological and business project within the policy of technological parks established by the national government. At Guatiguará there are already 14 research centers and specialized laboratories working with the national productive sector and the first two technology-based companies that will start the project's business component are about to be installed.</p> <p>More recently, huge efforts have been made to develop research activities for the benefits of Santander and Colombian citizens. Thus, 90 Groups, recognized by the Administrative Department of Science, Technology and Innovation (Colciencias), and five research centers dedicated to the areas of Materials, Energy, Agro-biotechnology, IT and Culture & Society are now the constituents of the task force at UIS dedicated to Research.</p>		

Only for Partner Country institutions, please provide information on:																			
Number of Memoranda of Cooperation/Understanding the HEI has signed with HEIs outside their own country?	135																		
Number of students	22,000																		
Number of Bachelor degrees offered	44																		
Number of Master degrees offered	50																		
Number of PhD degrees offered	10																		
Have you participated in CBHE? If yes, list CBHE projects titles and reference numbers. Describe curricular/ courses developed/ modernised, if any (name of the subject area and courses titles)	No, we have not participated, so far, in any CBHE project																		
<p>F.3.2 – Role of your organisation in the project Please describe also the role of your organisation in the project (limit 1000 characters).</p> <p>UIS is member of the LAGO and AUGER collaborations. In view of the expertise on instrumentation techniques for cosmic ray physics, UIS is an important contributor (with the WP leader USFQ) of the activities needed to install the laboratory facilities in all the Partner institutes. The RACIMO (Red Ambiental Ciudadana de MONitoreo) project, currently being developed at UIS, will be used as starting point for citizen science activities in the context of this LA-CoNGA Physics proposal. UIS has been an active participant and contributor to the CEVALE2VE project since its beginning. Luis A. Núñez will be acting as co-PI in this LA-CoNGA Physics project.</p>																			
<p>F.3.3 – Curriculum development project (only for Partner Country institutions) Please fill in if you are applying for a curriculum development project</p>																			
Please confirm that no similar curricula/ courses/modules were developed/modernised in Tempus IV projects in this HEI.	Choose an item.																		
<p>For new courses</p> <p>What new courses will the project implement in your HEI?</p> <p>For each course please fill the following nested table:</p> <table border="1"> <thead> <tr> <th>Title</th> <th></th> </tr> </thead> <tbody> <tr> <td>Level of study</td> <td></td> </tr> <tr> <td>List of subjects and credits (ECTS or comparable credit system) for each of them</td> <td></td> </tr> <tr> <td>Estimated date of accreditation and accreditation body</td> <td></td> </tr> <tr> <td>Estimated starting date of the new programme</td> <td></td> </tr> <tr> <td>Number of students to be accepted in the first year/ second year</td> <td></td> </tr> <tr> <td>Number of teaching staff to be trained</td> <td></td> </tr> <tr> <td>Internship /placements (if applicable)</td> <td></td> </tr> <tr> <td>List of equipment to be purchased for this course? (if applicable)</td> <td></td> </tr> </tbody> </table> <p><i>Please copy and paste nested tables as necessary</i></p>		Title		Level of study		List of subjects and credits (ECTS or comparable credit system) for each of them		Estimated date of accreditation and accreditation body		Estimated starting date of the new programme		Number of students to be accepted in the first year/ second year		Number of teaching staff to be trained		Internship /placements (if applicable)		List of equipment to be purchased for this course? (if applicable)	
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Number of teaching staff to be trained																			
Internship /placements (if applicable)																			
List of equipment to be purchased for this course? (if applicable)																			

For updated courses																			
Which existing courses will be updated in your HEI?																			
For each course please fill the following nested table:																			
<table border="1"> <tr><td>Title</td><td></td></tr> <tr><td>Level of study</td><td></td></tr> <tr><td>List of subjects and credits (ECTS or comparable credit system) for each of them</td><td></td></tr> <tr><td>Estimated date of accreditation and accreditation body</td><td></td></tr> <tr><td>% of the modernised subjects compared to total subjects included in the course</td><td></td></tr> <tr><td>Number of students to be accepted in the first year/ second year</td><td></td></tr> <tr><td>Number of teaching staff to be trained</td><td></td></tr> <tr><td>Internship /placements (if applicable)</td><td></td></tr> <tr><td>List of equipment to be purchased for this course? (if applicable)</td><td></td></tr> </table>	Title		Level of study		List of subjects and credits (ECTS or comparable credit system) for each of them		Estimated date of accreditation and accreditation body		% of the modernised subjects compared to total subjects included in the course		Number of students to be accepted in the first year/ second year		Number of teaching staff to be trained		Internship /placements (if applicable)		List of equipment to be purchased for this course? (if applicable)		
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Internship /placements (if applicable)																			
List of equipment to be purchased for this course? (if applicable)																			
<i>Please copy and paste nested tables as necessary</i>																			
F.3.4 – Modernisation of governance, management and functioning of HEIs (only for Partner Country institutions) <i>Please fill in if you are applying for this type of project and define clear the activities to be held in your institution (limit 2000 characters)</i>																			
Provide information on (if applicable)																			
Is the centre to be created a new one or an update?																			
If new, why is a new centre necessary? If updated, why is an updated centre necessary?																			
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The RACIMO project, initiated at IUS, is an innovative approach to the integration of academics within the society at large. UIS will be part of the one-year online master courses and one of the NS will be hosted in Bucamaranga, Colombia.

F.3.6 – Expected results and impact (only for Partner Country institutions)

What are the expected tangible results from the project in your HEI?

How will the impact of these results be measured in your HEI?

What financial means and human and other resources will be provided to sustain these results after the project ends?

F.3.7 - Operational capacity: Skills and expertise of key staff involved in the project

Please add lines as necessary.

Name of staff member	Summary of relevant skills and experience, including where relevant a list of recent publications related to the domain of the project.
Luis A. Núñez (LN)	<p>Senior Professor at UIS (2009-present). Former senior professor (1979-2009) at Universidad de los Andes, Mérida, Venezuela.</p> <p>National interlocutor for Venezuela of the</p> <ul style="list-style-type: none"> • HELEN program (2005-2009). • EELA: E-infrastructure shared between Europe and Latin America (2006-2008 https://cordis.europa.eu/project/rcn/80129/factsheet/en) • EELA-2 E-Science Grid Facility for Europe and Latin America (2008-2010 https://cordis.europa.eu/project/rcn/86622/factsheet/en) <p>Regional Interlocutor for Latin America</p> <ul style="list-style-type: none"> • GISELA Grid Initiatives for e-Science virtual communities in europe and Latin America (2010-2012 https://cordis.europa.eu/project/rcn/95836/factsheet/en) • CHAIN Co-ordination and Harmonisation of Advanced e-Infrastructures (2010-2012 https://cordis.europa.eu/project/rcn/95925/factsheet/en) • CHAIN-REDS Coordination and Harmonisation of Advanced e-Infrastructures for Research and Education Data Sharing (2012-2015 https://cordis.europa.eu/project/rcn/104593/factsheet/es) <p>Founder of CECALCULA, Venezuela's main National Supercomputer Center.</p> <p>Member of the Pierre Auger Observatory Collaboration.</p> <p>Main topics of expertise: general relativity, cosmic rays detectors, data analysis and High Performance Computing.</p> <p>A list of LAN scientific publications can be found in https://scholar.google.co.ve/citations?hl=en&user=2Q5_QxkAAAAJ&view_op=list_works</p>

Partner number <input checked="" type="checkbox"/>		P3
Organisation name & acronym	Universidad Antonio Nariño (UAN)	
F.3.1 - Aims and activities of the organisation Please provide a short presentation of your organisation (key activities, affiliations, size of the organisation, etc.) relating to the area covered by the project (limit 2000 characters).		

The UAN is a private, secular and comprehensive university, founded in 1976, which has a presence in 32 campuses in 28 cities in Colombia and targeted mainly on low-income student population with difficulties to access the public higher education. With 15,00 students, and 2000 teachers.

The University recognizes research and innovation as a fundamental axis that contributes to Colombia's development. From this perspective, our researchers receive permanent training in different topics plus academic and financial support for PhD studies, internships and mobility. It should be noted that UAN counts with the High-Level Training Program (PFAN) that has allowed to more than 80 teachers to achieve masters and doctoral degrees in countries as Germany, Spain, Chile, France, the USA and others.

UAN has more than 90 active bilateral and multilateral international agreements that promote academic and scientific cooperation and student exchange. In addition, at institutional level UAN is active in associations as AUIP, UDUAL, IAU, Universia and Association of University Research Parks. Likewise, the UAN research groups participate in collaborative international research networks.

Regarding to the mobility of students, UAN offers three reciprocal scholarships schemes, the Colombian-Mexican Academic Mobility, the Colombian-Argentinian Academic Mobility and the Brazilian-Colombian Academic Mobility. UAN is also member of the EMUAL and PAME academic exchange programs that offer reciprocal scholarships in over 200 Latin American universities members. Mobility scholarships are also made available to graduate students and post-doctoral professors by the AUIP.

At this time, UAN is carrying out the Internationalization Laboratory (UAN INT-LAB) with the guidance of the American Council on Education as a space for reflection and collective construction to develop a review of the institutional internationalization. UAN is currently one of the best universities in the country recognized for its strengths in research. According to some rankings, UAN is positioned as follows: ARWU Shanghai Ranking expanded Iberoamerican region: UAN is the 7th Colombian University. Scopus: 1st place in Colombia in the excellence indicator (62% of its scientific production in Q1). 1st place in Colombia in percentage of international research collaboration (82.6%).

Only for Partner Country institutions, please provide information on:

Number of Memoranda of Cooperation/Understanding the HEI has signed with HEIs outside their own country?	96 International Cooperation Agreements.
Number of students	15 000 students
Number of Bachelor degrees offered	91 Bachelor degrees
Number of Master degrees offered	18 master degrees and 14 specializations
Number of PhD degrees offered	3 PhD
Have you participated in CBHE? If yes, list CBHE projects titles and reference numbers. Describe curricular/ courses developed/ modernised, if any (name of the subject area and courses titles)	We have not had any involvement in a CBHE project, but we had submitted four (4) CBHE proposals in 2018 and we are planning to submit three (3) more for 2019 Erasmus+ call.

F.3.2 – Role of your organisation in the project

Please describe also the role of your organisation in the project (limit 1000 characters).

As a consequence of its participation in the HELEN program, the UAN particle physics group joined the ATLAS experiment by 2008. Since then, the UAN members have contributed to significant pieces of the ATLAS physics program.

UAN has been an active participant and contributor to the CEVALE2VE project since its beginning. In the context of this LA-CoNGA Physics proposal, UAN will be acting as coordinator of the "Training and education" Work Package.

F.3.3 – Curriculum development project (only for Partner Country institutions)

Please fill in if you are applying for a curriculum development project

Please confirm that no similar curricula/ courses/modules were developed/modernised in Tempus IV projects in this HEI.	Choose an item.																		
For new courses																			
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F.3.4 – Modernisation of governance, management and functioning of HEIs (only for Partner Country institutions) Please fill in if you are applying for this type of project and define clear the activities to be held in your institution (limit 2000 characters)																			

Provide information on (if applicable)	
Is the centre to be created a new one or an update?	
If new, why is a new centre necessary? If updated, why is an updated centre necessary?	
Where will the centre be located in the institution?	
Will this infrastructure be made available to the centre after the project ends?	
How many people will be employed in the centre?	
Will the institution fund these posts after the project ends?	
How many administrative staff will be trained?	
Which procedures will be updated /introduced in the institution?	
F.3.5 – Strengthening of relations between HEIs and the wider economic and social environment (only for Partner Country institutions) <i>Please fill in if you are applying for this type of project and define clear the activities to be held in your institution (limit 2000 characters)</i>	
The KM will take place in Bogota, Colombia. UAN will take part on the one year master courses and the associated trainings.	
F.3.6 – Expected results and impact (only for Partner Country institutions)	
What are the expected tangible results from the project in your HEI?	Basic electronics and computing laboratories
How will the impact of these results be measured in your HEI?	Masters students at the HEI will be exposed to a wide range of opportunities for their research and training through the courses offered in the project, and that are not available at the moment at the HEI. They will learn about data analytics, instrumentation and statistical analysis. Furthermore, by taking those courses with students and lecturers from different places, they will learn how to work in collaboration.
What financial means and human and other resources will be provided to sustain these results after the project ends?	By the number of students from the Masters' program involved in the courses. We currently have 1 student every 2 years joining the experimental High Energy Physics group.
F.3.7 - Operational capacity: Skills and expertise of key staff involved in the project <i>Please add lines as necessary.</i>	
Name of staff member	<i>Summary of relevant skills and experience, including where relevant a list of recent publications related to the domain of the project.</i>

Carlos Sandoval (CS)	Member of the ATLAS experiment since 2010, expertise in data analysis, particle physics, and particle detectors. One of the coordinators of the ICTP Physics Without Frontiers program for Latinoamerica Publication list: http://inspirehep.net/search?p=exactauthor%3AC.E.Sandoval.1+exactauthor%3A%22Sandoval%2C+Carlos%22
Gabriela Navarro (GN)	Member of the ATLAS experiment since 2008, expertise in data analysis, particle physics, and particle detectors. Participated in the CEVALE2 particle physics course in 2016 and 2017 as lecturer Publication list: http://inspirehep.net/search?p=exactauthor%3AG.A.Navarro.1+exactauthor%3A%22Navarro%2C+Gabriela%22

Partner number ☒		P4
Organisation name & acronym	Universidad San Francisco de Quito (USFQ)	
F.3.1 - Aims and activities of the organisation <i>Please provide a short presentation of your organisation (key activities, affiliations, size of the organisation, etc.) relating to the area covered by the project (limit 2000 characters).</i>		
<p>Universidad San Francisco de Quito was founded in 1988 at Quito, the capital city of Ecuador, Universidad San Francisco de Quito (USFQ) has the mission to train, educate, investigate and serve the community within the philosophy of the Liberal Arts, integrating all sectors of society. It is ranked among the best universities in Ecuador, ranked in the highest category (Category A) by the National Council for Evaluation and Accreditation of Higher Education CEAACES, and ranked as the best in Ecuador and 57 in Latin America at QS World University Ranking (https://www.topuniversities.com/university-rankings/latin-american-university-rankings/2018).</p> <p>Universidad San Francisco de Quito USFQ is a global leader in education, research, creativity, entrepreneurship and freedom in Latin America.</p> <p>Mission: USFQ forms, educates, researches, and serves the community within the philosophy of the liberal Arts, integrating all sectors of society</p> <p>Vision: USFQ will be a model University of education in Liberal Arts, entrepreneurship, scientific, technological and cultural development for Latin America, recognized for the quality and leadership of its graduates</p> <p>The liberal arts: It is an educational philosophy in which all disciplines of knowledge have equal importance and which seek to train free individuals, aware of their environment, self-confident entrepreneurs, creative and without conditioning.</p> <p>USFQ is divided into 10 faculties with several careers each, in particular Faculty of Science and Engineering (Colegio de Ciencias e Ingenierías “El Politécnico” was created in 1992, today it offers 12 careers, among them there are Physics, Mathematics, Chemical Engineering, Electrical Engineering, Computer Science, Mechanical Engineering. Because of the philosophy of USFQ all the above mentioned careers are closely related; students are allowed to take courses from different careers, it is not only allowed but encouraged to enhance the interdisciplinary work and cooperation.</p> <p>Teaching and research labs are open to all students, resources are shared to optimize resources and enhance capabilities. Two examples can be highlighted: USFQ DLab, it contains equipment and machinery to design and build prototypes of any kind. Leopard, Laboratorio de Partículas Astropartículas y Radiación, where students of physics, electrical and chemistry engineering and computer science can develop particle detectors.</p>		

Only for Partner Country institutions, please provide information on:		
Number of Memoranda of Cooperation/Understanding the HEI has signed with HEIs outside their own country?	More than 100 MOC/MOU with American and European Universities	
Number of students	9139	
Number of Bachelor degrees offered	41	
Number of Master degrees offered	10	
Number of PhD degrees offered	1	
Have you participated in CBHE? If yes, list CBHE projects titles and reference numbers. Describe curricular/ courses developed/ modernised, if any (name of the subject area and courses titles)	Programme or initiative	Reference number
	UNIVERSITEIT GHENT	5475
	UNIVERSITÉ DE BORDEAUX	999
	UNIVERSITE DE MONTPELLIER	10098
	NATURAL HISTORY MUSEUM	34
	UNIVERSITÉ DE TECHNOLOGIE TROYES	5424
	UNIVERSITE DE MONTPELLIER	5501
	UNIVERSITÉ DE TECHNOLOGIE TROYES	5425
F.3.2 – Role of your organisation in the project <i>Please describe also the role of your organisation in the project (limit 1000 characters).</i>		
Expertise on instrumentation Members of CMS and LAGO Responsible of the WP2 “Development and installation of tools” USFQ will be responsible for the installation and synchronisation of the instrumental benches in all the Partner HEIs.		
F.3.3 – Curriculum development project <i>(only for Partner Country institutions)</i> <i>Please fill in if you are applying for a curriculum development project</i>		
Please confirm that no similar curricula/ courses/modules were developed/modernised in Tempus IV projects in this HEI.	Choose an item.	
For new courses		
What new courses will the project implement in your HEI?		
For each course please fill the following nested table:		

Title	
Level of study	
List of subjects and credits (ECTS or comparable credit system) for each of them	
Estimated date of accreditation and accreditation body	
Estimated starting date of the new programme	
Number of students to be accepted in the first year/ second year	
Number of teaching staff to be trained	
Internship /placements (if applicable)	
List of equipment to be purchased for this course? (if applicable)	

Please copy and paste nested tables as necessary

For updated courses

Which existing courses will be updated in your HEI?

For each course please fill the following nested table:

Title	
Level of study	
List of subjects and credits (ECTS or comparable credit system) for each of them	
Estimated date of accreditation and accreditation body	
% of the modernised subjects compared to total subjects included in the course	
Number of students to be accepted in the first year/ second year	
Number of teaching staff to be trained	
Internship /placements (if applicable)	
List of equipment to be purchased for this course? (if applicable)	

Please copy and paste nested tables as necessary

F.3.4 – Modernisation of governance, management and functioning of HEIs (only for Partner Country institutions)

Please fill in if you are applying for this type of project and define clear the activities to be held in your institution (limit 2000 characters)

Provide information on (if applicable)

Is the centre to be created a new one or an update?

If new, why is a new centre necessary? If updated, why is an updated centre necessary?

Where will the centre be located in the institution?	
Will this infrastructure be made available to the centre after the project ends?	
How many people will be employed in the centre?	
Will the institution fund these posts after the project ends?	
How many administrative staff will be trained?	
Which procedures will be updated /introduced in the institution?	
F.3.5 – Strengthening of relations between HEIs and the wider economic and social environment (only for Partner Country institutions) <i>Please fill in if you are applying for this type of project and define clear the activities to be held in your institution (limit 2000 characters)</i>	
The second AGM will take place at Quito, Ecuador. The institution will take part on the one year master courses and the associated trainings.	
F.3.6 – Expected results and impact (only for Partner Country institutions)	
What are the expected tangible results from the project in your HEI?	Increase the number of students in both undergraduate and master physics programs Open collaborations with HEIs of Latin America Upgrade of the research facilities available
How will the impact of these results be measured in your HEI?	Statistics about number of students in master program Statistics about trained staff (Teachers and students) Inventory of Lab equipment
What financial means and human and other resources will be provided to sustain these results after the project ends?	Teachers and technicians trained during the project will be permanent staff of the Master program. ORI staff will continue performing coordination/management activities Financial resources for maintenance and upgrade of lab facilities will be provided
F.3.7 - Operational capacity: Skills and expertise of key staff involved in the project <i>Please add lines as necessary.</i>	
Name of staff member	<i>Summary of relevant skills and experience, including where relevant a list of recent publications related to the domain of the project.</i>
Dennis Cazar Ramirez (DC)	Design of Astroparticle detection systems WCDs for LAGO Collaboration Member of CMS (BRIL subsystem) 10 years experience in design, build and maintenance of Microwave systems for telecommunications Bachelor degree in Physics https://www.researchgate.net/profile/Dennis_Cazar_Ramirez Nonetheless, USFQ is a member of CMS experiment at CERN, Latin-American Giant Observatory LAGO participating in data analysis and developing of instrumentation mainly. LEOPARD (Laboratorio de Partículas Astropartículas y Radiación), radiation, particle, and astroparticle detection lab was installed in 2015 with essential equipment to perform data analysis of Compact Muon Solenoid (CMS) open data and develop low-cost data acquisition systems for astroparticle detection.

Edgar Carrera Jarrín (EC)	Montecarlo Simulations for HEP, Particle Physics, HEP, detectors Member of CMS (BRIL subsystem) https://www.researchgate.net/profile/Edgar_Carrera_Jarrin

Partner number ☒		P5
Organisation name & acronym	UNIVERSIDAD DE INVESTIGACIÓN DE TECNOLOGÍA EXPERIMENTAL YACHAY	
F.3.1 - Aims and activities of the organisation <i>Please provide a short presentation of your organisation (key activities, affiliations, size of the organisation, etc.) relating to the area covered by the project (limit 2000 characters).</i>		
<p>The Research University of Experimental Technology Yachay is a public institution of higher education founded in March 2014. Its objective is to position Ecuador as a center of innovation and technological excellence in America Latina. Within the educational institutions Ecuadoran higher education, Yachay Tech is an intensive research university that innovates and contributes to national agendas and regional research. The leadership The university is composed of the Rector, Chancellor and Vice Chancellor of Research and Innovation, who have successful careers from universities around the world. 100% of the faculty members has doctorates from international universities and 75% comes from more than 25 countries. countries around the world. The five schools of: Biological Sciences and Engineering; Sciences Chemicals and Engineering; Earth sciences, Energy and Environment; Mathematical Sciences and Computational; Physical Sciences and Nanotechnology, are each composed of two departments, one that focuses on science basic and the other in technology and engineering. These represent the concept of interaction close between the fundamental discovery and the application.</p>		
Only for Partner Country institutions, please provide information on:		
Number of Memoranda of Cooperation/Understanding the HEI has signed with HEIs outside their own country?	More than 20	
Number of students	2000	
Number of Bachelor degrees offered	11	
Number of Master degrees offered	1 submitted	
Number of PhD degrees offered	0	
Have you participated in CBHE? If yes, list CBHE projects titles and reference numbers. Describe curricular/ courses developed/ modernised, if any (name of the subject area and courses titles)	0	
F.3.2 – Role of your organisation in the project <i>Please describe also the role of your organisation in the project (limit 1000 characters).</i>		
<p>Yachay is a very young university, with intentions to quickly become a key player in HEP. Participation in this LA-CoNGA Physics project will provide a significant boost to the teaching of experimental HEP at Yachay. Also, the course on advanced theoretical physics will be prepared in close collaboration between Yachay and UPS.</p>		

F.3.3 – Curriculum development project *(only for Partner Country institutions)**Please fill in if you are applying for a curriculum development project*

Please confirm that no similar curricula/ courses/modules were developed/modernised in Tempus IV projects in this HEI.

Choose an item.

For new courses

What new courses will the project implement in your HEI?

For each course please fill the following nested table:

Title	
Level of study	
List of subjects and credits (ECTS or comparable credit system) for each of them	
Estimated date of accreditation and accreditation body	
Estimated starting date of the new programme	
Number of students to be accepted in the first year/ second year	
Number of teaching staff to be trained	
Internship /placements (if applicable)	
List of equipment to be purchased for this course? (if applicable)	

*Please copy and paste nested tables as necessary***For updated courses**

Which existing courses will be updated in your HEI?

For each course please fill the following nested table:

Title	
Level of study	
List of subjects and credits (ECTS or comparable credit system) for each of them	
Estimated date of accreditation and accreditation body	
% of the modernised subjects compared to total subjects included in the course	
Number of students to be accepted in the first year/ second year	
Number of teaching staff to be trained	
Internship /placements (if applicable)	
List of equipment to be purchased for this course? (if applicable)	

*Please copy and paste nested tables as necessary***F.3.4 – Modernisation of governance, management and functioning of HEIs** *(only for Partner Country institutions)**Please fill in if you are applying for this type of project and define clear the activities to be held in your institution (limit 2000 characters)*

Provide information on (if applicable)	
Is the centre to be created a new one or an update?	
If new, why is a new centre necessary? If updated, why is an updated centre necessary?	
Where will the centre be located in the institution?	
Will this infrastructure be made available to the centre after the project ends?	
How many people will be employed in the centre?	
Will the institution fund these posts after the project ends?	
How many administrative staff will be trained?	
Which procedures will be updated /introduced in the institution?	
F.3.5 – Strengthening of relations between HEIs and the wider economic and social environment (only for Partner Country institutions) <i>Please fill in if you are applying for this type of project and define clear the activities to be held in your institution (limit 2000 characters)</i>	
Being a young University, Yachay Tech is very strongly motivated to develop close links with the local environment. The citizen science projects will be very useful for this purpose. One of the NS will be hosted by Yachay. The institution will take part on the one year master courses and the associated trainings.	
F.3.6 – Expected results and impact (only for Partner Country institutions)	
What are the expected tangible results from the project in your HEI?	Create links between Latin-american students and Yachay Tech. Open the perspective to create co-habilitated Master and PhD programs in the long term.
How will the impact of these results be measured in your HEI?	Enrolled students in postgraduate program in Ecuador, number co-advised Master's PhD thesis.
What financial means and human and other resources will be provided to sustain these results after the project ends?	Funding generated by our own training programs and the Master's program itself with the prestige generated by the success of the first cohorts.
F.3.7 - Operational capacity: Skills and expertise of key staff involved in the project <i>Please add lines as necessary.</i>	
Name of staff member	<i>Summary of relevant skills and experience, including where relevant a list of recent publications related to the domain of the project.</i>
Ernesto Medina Dagger (EM)	Scientific skills : Condensed Matter Theory Some synergistic activities : Dean of the School of Physical Sciences and Nanotechnology See: https://scholar.google.com/citations?user=_5wHpEAAAAJ&hl=fr

Partner number ☒		P6
Organisation name & acronym	Universidad Nacional Mayor de San Marcos (UNMSM)	
F.3.1 - Aims and activities of the organisation <i>Please provide a short presentation of your organisation (key activities, affiliations, size of the organisation, etc.) relating to the area covered by the project (limit 2000 characters).</i>		
<p>The Universidad Nacional Mayor de San Marcos (UNMSM) is a public research university in Lima, Perú. Funded in 1551 is the first officially established university in America. It is regarded as an influential institution of higher-education, since the most important scientific and social research centers in the country germinated or belong to some of the 20 faculties (5 areas: health sciences, basic sciences, engineering, economic sciences and management, humanities and legal and social sciences) distributed in the university. Consistently ranks among the top two universities in Perú, been the most representative for his tradition, prestige, quality and selectivity.</p>		
Only for Partner Country institutions, please provide information on:		
Number of Memoranda of Cooperation/Understanding the HEI has signed with HEIs outside their own country?	812	
Number of students	37000	
Number of Bachelor degrees offered	65	
Number of Master degrees offered	77	
Number of PhD degrees offered	27	
Have you participated in CBHE? If yes, list CBHE projects titles and reference numbers. Describe curricular/ courses developed/ modernised, if any (name of the subject area and courses titles)	Yes. 1 project: ACACIA https://acacia.red/unmsm/	
F.3.2 – Role of your organisation in the project <i>Please describe also the role of your organisation in the project (limit 1000 characters).</i>		
<p>Staff from UNMSM will be responsible of the “Preparation” WP1. This work package is crucial to the good governance of the project, and will ensure the correct management of the program during its three years. At the end of the project, UNMSM will have a sustainable program of Master in HEP, in close collaboration with UNI and the other HEIs in the program.</p>		
F.3.3 – Curriculum development project <i>(only for Partner Country institutions)</i> <i>Please fill in if you are applying for a curriculum development project</i>		
Please confirm that no similar curricula/ courses/modules were developed/modernised in Tempus IV projects in this HEI.	Choose an item.	
For new courses		
What new courses will the project implement in your HEI?		
For each course please fill the following nested table:		

Title	
Level of study	
List of subjects and credits (ECTS or comparable credit system) for each of them	
Estimated date of accreditation and accreditation body	
Estimated starting date of the new programme	
Number of students to be accepted in the first year/ second year	
Number of teaching staff to be trained	
Internship /placements (if applicable)	
List of equipment to be purchased for this course? (if applicable)	

Please copy and paste nested tables as necessary

For updated courses																			
Which existing courses will be updated in your HEI?																			
For each course please fill the following nested table:																			
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Title																			
Level of study																			
List of subjects and credits (ECTS or comparable credit system) for each of them																			
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Number of teaching staff to be trained																			
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List of equipment to be purchased for this course? (if applicable)																			

F.3.4 – Modernisation of governance, management and functioning of HEIs (only for Partner Country institutions) <i>Please fill in if you are applying for this type of project and define clear the activities to be held in your institution (limit 2000 characters)</i>	

Provide information on (if applicable)	
Is the centre to be created a new one or an update?	
If new, why is a new centre necessary? If updated, why is an updated centre necessary?	

Where will the centre be located in the institution?	
Will this infrastructure be made available to the centre after the project ends?	
How many people will be employed in the centre?	
Will the institution fund these posts after the project ends?	
How many administrative staff will be trained?	
Which procedures will be updated /introduced in the institution?	
F.3.5 – Strengthening of relations between HEIs and the wider economic and social environment (only for Partner Country institutions) <i>Please fill in if you are applying for this type of project and define clear the activities to be held in your institution (limit 2000 characters)</i>	
The first AGM will take place at Lima, Peru. The institution will take part on the one year master courses and the associated trainings.	
F.3.6 – Expected results and impact (only for Partner Country institutions)	
What are the expected tangible results from the project in your HEI?	Basic instrumentation for laboratories in Particle Physics, improvement of the internet connectivity, creation of a course platform available for other areas and disciplines in UNMSM and the successful participation of the master students in the internships supported by the associated partners of LA-CoNGA Physics.
How will the impact of these results be measured in your HEI?	Number of thesis/projects/collaborations with the use of the equipment and/or involved with members of LA-CoNGA Physics network. Number of UNMSM faculties interested in create a one-year master program based in our proposal. Future agreements with associated partners in academia and/or industry
What financial means and human and other resources will be provided to sustain these results after the project ends?	Technicians and experts with management and development expertise on the implemented computer and electronic facilities. Grants (local from UNMSM and/or from government funding) related with future projects (academia/industry) based in the results of the master program.
F.3.7 - Operational capacity: Skills and expertise of key staff involved in the project <i>Please add lines as necessary.</i>	
Name of staff member	<i>Summary of relevant skills and experience, including where relevant a list of recent publications related to the domain of the project.</i>
Teofilo Vargas Auccalla (TV)	Gravitation, Cosmology and Field Theory. https://scholar.google.com.pe/citations?user=FWze0QgAAAAJ&hl=es&oi=sra

Partner number ☒		P7
Organisation name & acronym	Universidad Nacional de Ingeniería (UNI)	

F.3.1 - Aims and activities of the organisation

Please provide a short presentation of your organisation (key activities, affiliations, size of the organisation, etc.) relating to the area covered by the project (limit 2000 characters).

The Universidad Nacional de Ingeniería (UNI) is a public HEI founded in 1876, initially was created as a School of Engineering and become a University in 1955. In the present time has 11 faculties with 29 careers (mostly engineering), one of them is the Faculty of Sciences constituted of 4 basic sciences and 1 engineering departments (Chemistry, Mathematics, Physics, Computer Science and Physical Engineering). The UNI was founded with the objective of promoting the development of the country in the areas of its competence, continuing in our days with this main objective as well as being one of the main centers of applied and fundamental research in the country. Originally as a young republic, the Peruvian state promoted in great magnitude, various efforts in order to modernize and industrialize the country. Thus, the construction of railways, the mining exploitation, the development of infrastructure for roads, among others, were carried out. In those times, the main promoter of large infrastructure works was public administration. However, there was not a body of national professionals to lead these new projects, so most of them hired foreign professionals and the few Peruvians who were studying abroad at the time. For all this, UNI is one of the most important research HEIs in the country, as well as a key center for the generation of professionals in different strategic disciplines.

Only for Partner Country institutions, please provide information on:

Number of Memoranda of Cooperation/Understanding the HEI has signed with HEIs outside their own country?	1266
Number of students	12345
Number of Bachelor degrees offered	45
Number of Master degrees offered	52
Number of PhD degrees offered	6
Have you participated in CBHE? If yes, list CBHE projects titles and reference numbers. Describe curricular/ courses developed/ modernised, if any (name of the subject area and courses titles)	No

F.3.2 – Role of your organisation in the project

Please describe also the role of your organisation in the project (limit 1000 characters).

The main contributions from UNI staff to this project will be concentrated in the “Development” Work Package. Special emphasis will be given to the installation of instrumental material for the teaching laboratories, which will very positively allow to renew the existing infrastructure for experimental teaching. Also, the setting up of the e-learning tools will be crucial in increasing the attractiveness for prospective students.

F.3.3 – Curriculum development project (only for Partner Country institutions)

Please fill in if you are applying for a curriculum development project

Please confirm that no similar curricula/ courses/modules were developed/modernised in Tempus IV projects in this HEI.

Choose an item.

For new courses

What new courses will the project implement in your HEI?

For each course please fill the following nested table:

Title	
Level of study	
List of subjects and credits (ECTS or comparable credit system) for each of them	
Estimated date of accreditation and accreditation body	
Estimated starting date of the new programme	
Number of students to be accepted in the first year/ second year	
Number of teaching staff to be trained	
Internship /placements (if applicable)	
List of equipment to be purchased for this course? (if applicable)	

Please copy and paste nested tables as necessary

For updated courses

Which existing courses will be updated in your HEI?

For each course please fill the following nested table:

Title	
Level of study	
List of subjects and credits (ECTS or comparable credit system) for each of them	
Estimated date of accreditation and accreditation body	
% of the modernised subjects compared to total subjects included in the course	
Number of students to be accepted in the first year/ second year	
Number of teaching staff to be trained	
Internship /placements (if applicable)	
List of equipment to be purchased for this course? (if applicable)	

Please copy and paste nested tables as necessary

F.3.4 – Modernisation of governance, management and functioning of HEIs (only for Partner Country institutions)

Please fill in if you are applying for this type of project and define clear the activities to be held in your institution (limit 2000 characters)

Provide information on (if applicable)

Is the centre to be created a new one or an update?

If new, why is a new centre necessary? If updated, why is an updated centre necessary?

Where will the centre be located in the institution?	
Will this infrastructure be made available to the centre after the project ends?	
How many people will be employed in the centre?	
Will the institution fund these posts after the project ends?	
How many administrative staff will be trained?	
Which procedures will be updated /introduced in the institution?	
F.3.5 – Strengthening of relations between HEIs and the wider economic and social environment (only for Partner Country institutions) <i>Please fill in if you are applying for this type of project and define clear the activities to be held in your institution (limit 2000 characters)</i>	
<p>The implementation of the citizen science projects foreseen in this LA-CoNGA Physics proposal, will represent an innovative tool to link the academic activities at UNI and the high schools from the Lima region, will help promoting basic sciences among young persons, and will increase the attractivity of university studies in basic sciences. The first AGM will take place at Lima, Peru. The institution will take part on the one year master courses and the associated trainings.</p>	
F.3.6 – Expected results and impact (only for Partner Country institutions)	
What are the expected tangible results from the project in your HEI?	Increase the number of Master and PhD students in HEP, with the perspective to maintain an internship for all of them in the network established by the project in the Latin-American side or in EU.
How will the impact of these results be measured in your HEI?	A complete statistic about the number of students applying to the master and PhD programs, the enrollment of the accepted students in the one-year master course and the reports for the internships facilitated during the time of application of the project.
What financial means and human and other resources will be provided to sustain these results after the project ends?	Basic instrumentation, computational, and infrastructure facilities. Teachers and technicians trained in the use of the e-learning tools and the lab facilities will be continuing operating the platform after the project ends in order to serve as the core of research in the undergraduate and graduate level in HEP. (This will also ensure financing for research and maintenance of the facilities developed in the project)
F.3.7 - Operational capacity: Skills and expertise of key staff involved in the project <i>Please add lines as necessary.</i>	
Name of staff member	<i>Summary of relevant skills and experience, including where relevant a list of recent publications related to the domain of the project.</i>
Javier Solano (JS)	<p>HEP Experiments (DUNE, MINERvA, E791), HEP Phenomenology, Electromagnetism of Low/Medium Frequencies, Grid Computing, Computational Physics.</p> <p>Member of DUNE experience since 2016. Member of MINERvA experiment since 2005. Full-time Professor of Physics at UNI since 2004. Mentoring and advising 18 theses at the undergraduate, master and PhD level. Leading researcher in various governmental and local grants obtained in benefit of UNI to research in HEP projects. Director of the Graduate Program of the Faculty of Sciences at UNI, 2012-2015</p>

	Director of the FONDECYT (Fondo Nacional de Ciencia y Tecnología, in spanish) in 2011 http://inspirehep.net/author/profile/C.J.Solano.Salinas.1?ln=es https://compinformatidf.wordpress.com/2011/04/27/614/
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Partner number ☒		P8
Organisation name & acronym	Universidad Central de Venezuela (UCV)	
F.3.1 - Aims and activities of the organisation <i>Please provide a short presentation of your organisation (key activities, affiliations, size of the organisation, etc.) relating to the area covered by the project (limit 2000 characters).</i>		
<p>The Universidad Central de Venezuela is a public venezuelan university founded in 1721. Their main campus is located in Caracas and has two additional locations in Maracay and Barquisimeto cities.</p> <p>The UCV is organised in 11 faculties. These faculties cover a wide range of areas of knowledge. Today UCV offers 62 bachelor, 115 master and 41 doctoral degrees.</p>		
Only for Partner Country institutions, please provide information on:		
Number of Memoranda of Cooperation/Understanding the HEI has signed with HEIs outside their own country?		59
Number of students		60000
Number of Bachelor degrees offered		62
Number of Master degrees offered		115
Number of PhD degrees offered		41
Have you participated in CBHE? If yes, list CBHE projects titles and reference numbers. Describe curricular/ courses developed/ modernised, if any (name of the subject area and courses titles)		
F.3.2 – Role of your organisation in the project <i>Please describe also the role of your organisation in the project (limit 1000 characters).</i>		
<p>The two partner HEIs from Venezuela, UCV and USB, are proceeding in a common strategy in their participation to the LA-CoNGA Physics project. This synergy in their efforts is driven as a mechanism to mitigate the well-known difficult situation in Venezuela: brain drain, loss of human resources, extremely limited access to local resources, a negative trend in terms of number of students, etc...</p> <p>Within this project, the responsibility of WP5 “Dissemination and Exploitation” will be jointly managed by UCV and USB.</p> <p>A single, common instrumental facility will be installed through the LA-CoNGA Physics resources.</p>		
F.3.3 – Curriculum development project <i>(only for Partner Country institutions)</i> <i>Please fill in if you are applying for a curriculum development project</i>		

Please confirm that no similar curricula/ courses/modules were developed/modernised in Tempus IV projects in this HEI.	Choose an item.																		
For new courses																			
What new courses will the project implement in your HEI?																			
For each course please fill the following nested table:																			
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Provide information on (if applicable)	
Is the centre to be created a new one or an update?	
If new, why is a new centre necessary? If updated, why is an updated centre necessary?	
Where will the centre be located in the institution?	
Will this infrastructure be made available to the centre after the project ends?	
How many people will be employed in the centre?	
Will the institution fund these posts after the project ends?	
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F.3.5 – Strengthening of relations between HEIs and the wider economic and social environment (only for Partner Country institutions) <i>Please fill in if you are applying for this type of project and define clear the activities to be held in your institution (limit 2000 characters)</i>	
<p>If approved, the LA-CoNGA Physics project will play a key role in sustaining the teaching activities at UCV and USB. By mitigating the effects from brain drain and negative trend in number of students, by giving access to the e-learning platform tools to other Masters (first to other departments of fundamental sciences, later to a larger array of fields), the overall impact of this project can be very significant.</p>	
F.3.6 – Expected results and impact (only for Partner Country institutions)	
What are the expected tangible results from the project in your HEI?	A working e-learning platform for high energy physics.
How will the impact of these results be measured in your HEI?	By reverting the current trend in number of staff and students.
What financial means and human and other resources will be provided to sustain these results after the project ends?	Basic infrastructure. Laboratory and computer technicians. Financial support for students.
F.3.7 - Operational capacity: Skills and expertise of key staff involved in the project <i>Please add lines as necessary.</i>	
Name of staff member	<i>Summary of relevant skills and experience, including where relevant a list of recent publications related to the domain of the project.</i>
José Antonio López Rodríguez (JAL)	Director of Escuela de Física High Energy Physics E-learning https://orcid.org/0000-0003-3613-3406
Anamaría Font (AF)	Theoretical High-Energy Physics. Senior professor at UCV, Associated researcher at ICTP

Partner number ☒	Universidad Simón Bolívar (USB)	P9
Organisation name & acronym	Universidad Simón Bolívar (USB)	
F.3.1 - Aims and activities of the organisation <i>Please provide a short presentation of your organisation (key activities, affiliations, size of the organisation, etc.) relating to the area covered by the project (limit 2000 characters).</i>		
<p>Simón Bolívar University is a public institution created in 1967. It started its academic activities in 1970 in the Sartenejas Valley in Caracas and seven years later in the Camurí Grande Valley in the Vargas state. It is dedicated to the creation and discovering of knowledge to improve the well-being of the people and to the formation of professionals to carry on this goal. Simón Bolívar University offers programs of 3 years for technicians, 5 years programs in basics sciences and engineering as well as master and doctorate programs in the same areas. It also offers post-graduate programs in economics, development studies and related topics. The university is organized in 4 divisions, a division of physical and mathematical sciences with 12 departments, a division of biological sciences with 4 departments a division of social sciences with eight departments and a division of technological studies with 3 departments. More than forty established research groups, distributed in the various departments receive direct support by the office of the Dean of research and development. The university also counts with a technological park and startup incubator.</p>		
Only for Partner Country institutions, please provide information on:		
Number of Memoranda of Cooperation/Understanding the HEI has signed with HEIs outside their own country?		
Number of students	10000	
Number of Bachelor degrees offered	36	
Number of Master degrees offered	31	
Number of PhD degrees offered	15	
Have you participated in CBHE? If yes, list CBHE projects titles and reference numbers. Describe curricular/ courses developed/ modernised, if any (name of the subject area and courses titles)	Erasmus+ 2015 CityLabs Universidad Simón Bolívar. Local coordinator: Sandra Ornés Erasmus+ 2017 Mobility for learners and staff - interinstitutional agreement between Univestiatea din Oradea and Universidad Simón Bolívar Universidad Simón Bolívar. Local coordinator: Rafael Rodríguez Erasmus mundus 2013-16 PRECIOSA	

		Universidad Simón Bolívar. Local coordinator: Héctor Maldonado																		
F.3.2 – Role of your organisation in the project Please describe also the role of your organisation in the project (limit 1000 characters).																				
The two partner HEIs from Venezuela, UCV and USB, are proceeding in a common strategy in their participation to the LA-CoNGA Physics project. This synergy in their efforts is driven as a mechanism to mitigate the well-known difficult situation in Venezuela: brain drain, loss of human resources, extremely limited access to local resources, a negative trend in terms of number of students, etc... Within this project, the responsibility of WP5 “Dissemination and Exploitation” will be jointly managed by UCV and USB. A single, common instrumental facility will be installed through the LA-CoNGA Physics resources.																				
F.3.3 – Curriculum development project (only for Partner Country institutions) Please fill in if you are applying for a curriculum development project																				
Please confirm that no similar curricula/ courses/modules were developed/modernised in Tempus IV projects in this HEI.		Choose an item.																		
For new courses What new courses will the project implement in your HEI?																				
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Title																				
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Estimated date of accreditation and accreditation body																				

% of the modernised subjects compared to total subjects included in the course	
Number of students to be accepted in the first year/ second year	
Number of teaching staff to be trained	
Internship /placements (if applicable)	
List of equipment to be purchased for this course? (if applicable)	

Please copy and paste nested tables as necessary

F.3.4 – Modernisation of governance, management and functioning of HEIs (only for Partner Country institutions)
Please fill in if you are applying for this type of project and define clear the activities to be held in your institution (limit 2000 characters)

Provide information on (if applicable)

Is the centre to be created a new one or an update?	
If new, why is a new centre necessary? If updated, why is an updated centre necessary?	
Where will the centre be located in the institution?	
Will this infrastructure be made available to the centre after the project ends?	
How many people will be employed in the centre?	
Will the institution fund these posts after the project ends?	
How many administrative staff will be trained?	
Which procedures will be updated /introduced in the institution?	

F.3.5 – Strengthening of relations between HEIs and the wider economic and social environment (only for Partner Country institutions)
Please fill in if you are applying for this type of project and define clear the activities to be held in your institution (limit 2000 characters)

If approved, the LA-CoNGA Physics project will play a key role in sustaining the teaching activities at UCV and USB. By mitigating the effects from brain drain and negative trend in number of students, by giving access to the e-learning platform tools to other Masters (first to other departments of fundamental sciences, later to a larger array of fields), the overall impact of this project can be very significant.

F.3.6 – Expected results and impact (only for Partner Country institutions)

What are the expected tangible results from the project in your HEI?	A working e-learning platform for high energy physics.
How will the impact of these results be measured in your HEI?	By reverting the current trend in number of staff and students.

What financial means and human and other resources will be provided to sustain these results after the project ends?	Basic infrastructure. Laboratory and computer technicians. Financial support for students.
F.3.7 - Operational capacity: Skills and expertise of key staff involved in the project <i>Please add lines as necessary.</i>	
Name of staff member	Summary of relevant skills and experience, including where relevant a list of recent publications related to the domain of the project.
Jorge Stephany (JS)	Theoretical high energy and quantum physics. Teaching in the Physics program (undergraduate, master and doctorate) of USB for 27 years https://orcid.org/0000-0001-8132-2754

Partner number <input checked="" type="checkbox"/>		P10
Organisation name & acronym	University Paul Sabatier, Toulouse III (UPS)	
F.3.1 - Aims and activities of the organisation <i>Please provide a short presentation of your organisation (key activities, affiliations, size of the organisation, etc.) relating to the area covered by the project (limit 2000 characters).</i>		
<p>The University Paul Sabatier is part of the University of Toulouse. Its aim is to provide high quality higher education programs in science, health, sport, engineering and technology. It host more than 31000 students in undergraduate and graduate programs. Last year, Toulouse was awarded with the creation of an “Ecole Universitaire de Recherche” (EUR), named “Nanoscale Science and Engineering” whose aim is, among others, to promote Toulouse as an international high level training center in Science and Engineering, promote the international mobility of master or PhD students and strengthen relationships with the socio-economic world. This EUR is associated to a “Laboratoire d’Excellence”, Labex, named NEXT encompassing six physics laboratories and 450 persons (including 200 researchers) in Toulouse. Most of the operations undertaken by NEXT aim to develop new scientific axes, to exploit complementary expertise and to connect different domains of research within ambitious, original, but consistent and realistic scientific projects. In addition, the six laboratories of NEXT are associated with a doctoral school (Sciences de la Matière), and NEXT scientists are strongly involved at the Master and doctoral level. Scientific achievements of NEXT are also exploited through a strong interaction with the private sector, patent filings, conference organization, and publications in high quality journals.</p>		
Only for Partner Country institutions, please provide information on:		
Number of Memoranda of Cooperation/Understanding the HEI has signed with HEIs outside their own country?		
Number of students	31 723	
Number of Bachelor degrees offered	88 (including the so-called “License Pro”).	
Number of Master degrees offered	46	
Number of PhD degrees offered	12 PhD programs supported by the UPS within a broader PhD program supported by the University of Toulouse.	
Have you participated in CBHE? If yes, list CBHE projects titles and reference numbers. Describe curricular/ courses developed/ modernised, if any (name of the subject area and courses titles)		
F.3.2 – Role of your organisation in the project <i>Please describe also the role of your organisation in the project (limit 1000 characters).</i>		

While there are no experimental HEP groups in Toulouse, the Physics department at Paul Sabatier has a significant expertise in theoretical physics, which nicely complements the landscape of expertises required to produce a high-level Master program in HEP.

Within the LA-CoNGA Physics project, Paul Sabatier University will be in charge of WP4 “Quality Plan”, an important task to ensure that the project fulfills all its goals.

Also, Pierre Pujol will contribute in detail, together with Ernesto Medina from Yachay Tech University, to the preparation of the advanced theoretical physics elective module.

F.3.3 – Curriculum development project *(only for Partner Country institutions)*

Please fill in if you are applying for a curriculum development project

Please confirm that no similar curricula/ courses/modules were developed/modernised in Tempus IV projects in this HEI.

Choose an item.

For new courses

What new courses will the project implement in your HEI?

For each course please fill the following nested table:

Title	
Level of study	
List of subjects and credits (ECTS or comparable credit system) for each of them	
Estimated date of accreditation and accreditation body	
Estimated starting date of the new programme	
Number of students to be accepted in the first year/ second year	
Number of teaching staff to be trained	
Internship /placements (if applicable)	
List of equipment to be purchased for this course? (if applicable)	

Please copy and paste nested tables as necessary

For updated courses

Which existing courses will be updated in your HEI?

For each course please fill the following nested table:

Title	
Level of study	
List of subjects and credits (ECTS or comparable credit system) for each of them	
Estimated date of accreditation and accreditation body	
% of the modernised subjects compared to total subjects included in the course	
Number of students to be accepted in the first year/ second year	
Number of teaching staff to be trained	
Internship /placements (if applicable)	
List of equipment to be purchased for this course? (if applicable)	

Please copy and paste nested tables as necessary

F.3.4 – Modernisation of governance, management and functioning of HEIs (only for Partner Country institutions)

Please fill in if you are applying for this type of project and define clear the activities to be held in your institution (limit 2000 characters)

Provide information on (if applicable)

Is the centre to be created a new one or an update?

If new, why is a new centre necessary? If updated, why is an updated centre necessary?

Where will the centre be located in the institution?

Will this infrastructure be made available to the centre after the project ends?

How many people will be employed in the centre?

Will the institution fund these posts after the project ends?

How many administrative staff will be trained?

Which procedures will be updated /introduced in the institution?

F.3.5 – Strengthening of relations between HEIs and the wider economic and social environment (only for Partner Country institutions)

Please fill in if you are applying for this type of project and define clear the activities to be held in your institution (limit 2000 characters)

F.3.6 – Expected results and impact (only for Partner Country institutions)

What are the expected tangible results from the project in your HEI?

How will the impact of these results be measured in your HEI?

What financial means and human and other resources will be provided to sustain these results after the project ends?

F.3.7 - Operational capacity: Skills and expertise of key staff involved in the project

Please add lines as necessary.

Name of staff member

Summary of relevant skills and experience, including where relevant a list of recent publications related to the domain of the project.

Pierre Pujol (PP)	Scientific skills : Field theory for statistical physics and condensed matter Some synergistic activities : Vice president of the section 29 of the CNU (Conseil National des Universités) Former president of the regional section of the SFP (Société Française de Physique) See: http://www.lpt.ups-tlse.fr/pujol Or https://scholar.google.fr/citations?user=-ocrmb0AAAAJ&hl=fr

Partner number ☒		P11
Organisation name & acronym	TECHNISCHE UNIVERSITAET DRESDEN (TUD)	
F.3.1 - Aims and activities of the organisation <i>Please provide a short presentation of your organisation (key activities, affiliations, size of the organisation, etc.) relating to the area covered by the project (limit 2000 characters).</i>		
<p>The TUD is one of the leading universities in Germany, awarded by the German government as a 'University of Excellence'. TUD has ca. 34,000 students and over 7,600 employees, 560 professors among them. As a full-curriculum university with 18 faculties, it offers a broad variety of 129 degree programmes. The TUD emphasizes international cooperation, and encourages its students to participate early on in both teaching and research. Interdisciplinary cooperation among various fields is a strength of the TUD. Researchers benefit from collaborations with the region's numerous science institutions like Fraunhofer, Leibniz and Max Planck institutes. In recognition of TUD's emphasis on applications, leading companies have honored the university with currently 14 endowed chairs. The TUD has partnerships with over 70 universities worldwide. It is the only university in East Germany which has been granted a graduate school and three clusters in the German excellence initiative. Currently, TUD ranks fourth among German universities in terms of the number of Horizon 2020 projects. The Institute of Nuclear and Particle Physics of the TU Dresden (IKTP) conducts basic research in the field of experimental and theoretical elementary particle physics, on the structure and formation of our universe, as well as in the field of experimental nuclear astrophysics and the measurement of radiation doses in technical and medical applications. In addition, the Institute realizes several national and international projects on the transfer of scientific knowledge to the public.</p>		
Only for Partner Country institutions, please provide information on:		
Number of Memoranda of Cooperation/Understanding the HEI has signed with HEIs outside their own country?		
Number of students	34000	
Number of Bachelor degrees offered	129	
Number of Master degrees offered	24	
Number of PhD degrees offered		
Have you participated in CBHE? If yes, list CBHE projects titles and reference numbers. Describe curricular/ courses developed/ modernised, if any (name of the subject area and courses titles)	No	

F.3.2 – Role of your organisation in the project

Please describe also the role of your organisation in the project (limit 1000 characters).

TUD will perform a key role in the dissemination plan given its expertise in this area and will also cooperate to the diversity and inclusion aspects. TUD has a strong particle physics program from the experimental and theoretical point of view. TUD will host internships funded through the LA-CoNGA Physics program

F.3.3 – Curriculum development project (only for Partner Country institutions)

Please fill in if you are applying for a curriculum development project

Please confirm that no similar curricula/ courses/modules were developed/modernised in Tempus IV projects in this HEI.

Choose an item.

For new courses

What new courses will the project implement in your HEI?

For each course please fill the following nested table:

Title	
Level of study	
List of subjects and credits (ECTS or comparable credit system) for each of them	
Estimated date of accreditation and accreditation body	
Estimated starting date of the new programme	
Number of students to be accepted in the first year/ second year	
Number of teaching staff to be trained	
Internship /placements (if applicable)	
List of equipment to be purchased for this course? (if applicable)	

Please copy and paste nested tables as necessary

For updated courses

Which existing courses will be updated in your HEI?

For each course please fill the following nested table:

Title	
Level of study	
List of subjects and credits (ECTS or comparable credit system) for each of them	
Estimated date of accreditation and accreditation body	
% of the modernised subjects compared to total subjects included in the course	
Number of students to be accepted in the first year/ second year	
Number of teaching staff to be trained	

Internship /placements (if applicable)	
List of equipment to be purchased for this course? (if applicable)	
<i>Please copy and paste nested tables as necessary</i>	
F.3.4 – Modernisation of governance, management and functioning of HEIs (only for Partner Country institutions) <i>Please fill in if you are applying for this type of project and define clear the activities to be held in your institution (limit 2000 characters)</i>	
Provide information on (if applicable)	
Is the centre to be created a new one or an update?	
If new, why is a new centre necessary? If updated, why is an updated centre necessary?	
Where will the centre be located in the institution?	
Will this infrastructure be made available to the centre after the project ends?	
How many people will be employed in the centre?	
Will the institution fund these posts after the project ends?	
How many administrative staff will be trained?	
Which procedures will be updated /introduced in the institution?	
F.3.5 – Strengthening of relations between HEIs and the wider economic and social environment (only for Partner Country institutions) <i>Please fill in if you are applying for this type of project and define clear the activities to be held in your institution (limit 2000 characters)</i>	
F.3.6 – Expected results and impact (only for Partner Country institutions)	
What are the expected tangible results from the project in your HEI?	
How will the impact of these results be measured in your HEI?	
What financial means and human and other resources will be provided to sustain these results after the project ends?	

F.3.7 - Operational capacity: Skills and expertise of key staff involved in the project <i>Please add lines as necessary.</i>	
Name of staff member	Summary of relevant skills and experience, including where relevant a list of recent publications related to the domain of the project.
Joany Manjarres (JM)	<p>JM is been part of the ATLAS collaboration since 2011. She is a former HELEN grant-holder. She is part of the CEVALE2VE research and teaching community aiming to bring HEP to Latin-American Universities. JM was WG leader of the VBSCan COST Action. Member and lecturer of the CEVALE2 particle physics initiative since 2014.</p> <ol style="list-style-type: none"> 1. Observation of electroweak production of a same-sign W boson pair in association with two jets in pp collisions at $\sqrt{s}=13$ TeV with the ATLAS detector. ATLAS-CONF-2018-030. 2. Observation of electroweak $W^\pm Z$ boson pair production in association with two jets in pp collisions at $\sqrt{s} = 13$TeV with the ATLAS Detector. ATLAS-CONF-2018-033

Partner number ☒		P12
Organisation name & acronym	CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE CNRS	
F.3.1 - Aims and activities of the organisation <i>Please provide a short presentation of your organisation (key activities, affiliations, size of the organisation, etc.) relating to the area covered by the project (limit 2000 characters).</i>		
<p>The French National Centre for Scientific Research is among the world's leading research institutions. Its scientists explore the living world, matter, the Universe, and the functioning of human societies in order to meet the major challenges of today and tomorrow. Internationally recognised for the excellence of its scientific research, the CNRS is a reference in the world of research and development, as well as for the general public.</p> <p>CNRS is organized in ten national institutes. IN2P3, Institut National de Physique Nucléaire et Physique des Particules, is the institute in charge of experimental HEP at CNRS. IN2P3 has 19 laboratories, 13 research and technological platforms, over most of France's territory. All IN2P3 laboratories are joint structures with one or more Universities as partners.</p> <p>LPNHE, Laboratoire de Physique Nucléaire et des Hautes Energies, is one of two IN2P3 laboratories in downtown Paris. It specialises in experimental HEP in colliders (with strong teams members of the ATLAS and LHCb experiments at the LHC), astroparticle physics and cosmology.</p> <p>LPNHE is parter of Université Paris Diderot and Sorbonne Université.</p>		

Only for Partner Country institutions, please provide information on:																			
Number of Memoranda of Cooperation/Understanding the HEI has signed with HEIs outside their own country?																			
Number of students	N.A.																		
Number of Bachelor degrees offered	N.A.																		
Number of Master degrees offered	N.A.																		
Number of PhD degrees offered	N.A.																		
Have you participated in CBHE? If yes, list CBHE projects titles and reference numbers. Describe curricular/ courses developed/ modernised, if any (name of the subject area and courses titles)																			
F.3.2 – Role of your organisation in the project <i>Please describe also the role of your organisation in the project (limit 1000 characters).</i>																			
<p>LPNHE has been a core participant in the HELEN and EPLANET programs, and has hosted a large number of cooperation activities with Latin American institutes. Several students from Latin America have prepared a PhD at LPNHE.</p> <p>In view of its close links with two universities (both with strong programs in fundamental sciences, including HEP), the research staff at LPNHE is very familiar with teaching and teaching-related activities.</p> <p>One staff CNRS researcher will devote 20% of her time to the LA-CoNGA Physics project. The PI of the project is also member of LPNHE.</p> <p>LPNHE will host internships funded through the LA-CoNGA Physics program.</p>																			
F.3.3 – Curriculum development project (only for Partner Country institutions) <i>Please fill in if you are applying for a curriculum development project</i>																			
Please confirm that no similar curricula/ courses/modules were developed/modernised in Tempus IV projects in this HEI.	Choose an item.																		
For new courses																			
What new courses will the project implement in your HEI?																			
For each course please fill the following nested table:																			
<table border="1"> <tr><td>Title</td><td></td></tr> <tr><td>Level of study</td><td></td></tr> <tr><td>List of subjects and credits (ECTS or comparable credit system) for each of them</td><td></td></tr> <tr><td>Estimated date of accreditation and accreditation body</td><td></td></tr> <tr><td>Estimated starting date of the new programme</td><td></td></tr> <tr><td>Number of students to be accepted in the first year/ second year</td><td></td></tr> <tr><td>Number of teaching staff to be trained</td><td></td></tr> <tr><td>Internship /placements (if applicable)</td><td></td></tr> <tr><td>List of equipment to be purchased for this course? (if applicable)</td><td></td></tr> </table>	Title		Level of study		List of subjects and credits (ECTS or comparable credit system) for each of them		Estimated date of accreditation and accreditation body		Estimated starting date of the new programme		Number of students to be accepted in the first year/ second year		Number of teaching staff to be trained		Internship /placements (if applicable)		List of equipment to be purchased for this course? (if applicable)		
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F.3.6 – Expected results and impact (<i>only for Partner Country institutions</i>)	
What are the expected tangible results from the project in your HEI?	
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F.3.7 - Operational capacity: Skills and expertise of key staff involved in the project <i>Please add lines as necessary.</i>	
Name of staff member	<i>Summary of relevant skills and experience, including where relevant a list of recent publications related to the domain of the project.</i>
Reina Camacho (RC)	<p>Staff researcher at CNRS-IN2P3 since 2017. Former HELEN grant-holder. Member of the ATLAS collaboration since 2010. Coordinator of several physics analysis groups in ATLAS.</p> <p>Co-founder of the CEVALE2VE project. Coordinator of the ICTP Physics Without Frontiers program for Latin America.</p> <p>http://inspirehep.net/search?ln=en&ln=en&p=find+a+camacho+toro%2C+r&of=hcs&action_search=Search&sf=earliestdate&so=d&rm=&rg=25&sc=0</p>

Please complete the following Logical Framework Matrix:

F.4 List of Associated Partners

(Where applicable)

Capacity-building projects can involve associated partners who contribute to the implementation of specific project tasks/activities or support the dissemination and sustainability of the project. Associated Partners cannot be responsible for core activities of the project (e.g. management, coordination, monitoring, leader of a work group etc.). **No financial contribution from the project grant will be allocated to these organisations.**

Name of organisation	Type of institution	Website	City	Country	Role in the project	Activities and related Work Packages
DESY (Deutsches Elektronen-Synchrotron)	National research center	http://www.desy.de	Hamburg	Germany	Student mobility, Advisory role, networking & dissemination	DESY conducts a broad spectrum of interdisciplinary scientific research in three main areas: particle physics, photon science; and the development, construction and operation of particle accelerators. DESY will host students for 3-month internships in the context of the mobility scheme and offer them training programs in topics related to particle physics new developments, statistics and Monte Carlo simulation through the “Physics at the Terascale” Academic Training program (WP3). The research center will also host LA-CoNGA-Physics project activities within their network of contacts (WP5). DESY will also be part of the External Advisory Board (EAB) (WP6)

CERN (European Organization for Nuclear Research)	International research center	https://home.cern	Geneva	France and Switzerland	Student mobility, Advisory role, networking & dissemination	<p>CERN is one of the world's largest and most respected centres for scientific research. It hosts the most powerful particle accelerator in the world, the Large Hadron Collider (LHC) and provide different infrastructure needed for high energy physics research. Funded in 1954 and with 23 member states CERN main goal are related to discovery through science, technological innovation, advocating investment in fundamental research and evidence-based policy, training of new generations of scientists and engineers and nurture scientific awareness in all citizens. CERN will host students for 3-month internships in the context of the mobility scheme and offer them training programs in topics related to particle physics new developments, statistics and education through the continuous CERN Academic Training program and the seminar series organized at CERN (WP3). The research center will also promote LA-CONGA Physics project activities within their network of contacts (WP5). CERN will also be part of the External Advisory Board (EAB) (WP6).</p>
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IRFU (Institut de recherche sur les lois fondamentales de l'Univers)	National research center	http://irfu.cea.fr/	Saclay	France	Student mobility, Advisory role, networking & dissemination	<p>IRFU, Institute for Research on the fundamental laws of the universe, of the Fundamental Research Division of the CEA, brings together three scientific disciplines, astrophysics, nuclear physics and particle physics, as well as all the associated technological expertise. Irfu is positioned to answer the main questions we face in understanding the four fundamental interactions, at different scales, from the very smallest (building blocks of matter, nuclear matter) to the largest (energy content and structure of the Universe).</p> <p>IRFU will host students for 3-month internships in the context of the mobility scheme and offer them training programs in topics related to particle physics new developments, statistics and education through its continuous training program and the seminar series organized at IRFU (WP3). The research center will also promote LA-CONGA Physics project activities within their network of contacts (WP5). IRFU will also be part of the External Advisory Board (EAB) (WP6).</p>
ICTP (Abdus Salam International Centre for Theoretical Physics)	International research center	https://www.ictp.it/	Trieste	Italy	Student mobility, Advisory role, networking & dissemination	<p>ICTP is an international research institute for physical and mathematical sciences that operates under a tripartite agreement between the Italian government, UNESCO, and the International Atomic Energy Agency (IAEA). Its independent relations to LA (it has recently established new branches in Chiapas, Mexico, and Sao Paulo, Brazil) makes it an important associated partner. ICTP will host students for 3-month internships within WP3. They</p>

						will also participate in the Network Schools (NS), advice regarding the curricula development (WP3) and will also promote the project activities within their network of contacts (WP5). ICTP will help organising the data challenges with the input from other associated academic and non-academic partners. ICTP will also be part of the External Advisory Board (EAB) (WP6).
New York Academy of Sciences (NYAS)	Independent, non-profit organization	https://www.nyas.org/	New York	United States	Training, Advisory role, networking & dissemination	NYAS' mission is to advance scientific research and knowledge; to support scientific literacy; and to promote the resolution of society's global challenges through science-based solutions. It counts with more than 20,000 members in 100 countries. Through its Science Alliance program the NYAS will provide the members of LA-CoNGA Physics skill building online workshops on effective grant-writing, securing research funding, communications & career planning; leadership online training and networking with contacts and opportunities outside academia (WP3). They will also participate in the Network Schools (NS) and will also promote the project activities within their network of contacts (WP5).
Colombian Association for the Advancement of Science (ACAC)	Independent, non-profit organization	https://acac.org.co/	Bogota	Colombia	Training, Advisory role, networking & dissemination	ACAC is a scientific association. It contributes to the promotion of science, technology and innovation by creating public awareness of its importance and developing strategies for the benefit of society. ACAC offers services like ICT capacitation, project management in science and technology, scientific and technology events organisation. ACAC will offer his services to the LA-CoNGA Physics (WP3). They will also participate in the Network Schools (NS) and will also promote the project activities within their network of contacts (WP5).
RedCLARA- Latin American Advanced Networks Cooperation	International organization	https://redclara.net	Headquarters in	Chile	Training, Advisory role, networking & dissemination	RedCLARA is an international organization whose aim is to strengthen the development of science, education, culture and innovation in Latin America,

			Santiago de Chile			through the innovative use of networks, infrastructure and advanced information technologies. LA-CoNGA Physics e-learning platform will be created based on current tools from RedCLARA and CEVALE2VE (WP1). RedCLARA will also help with the training for these tools (WP3) and with the promotion of project activities within their network of contacts (WP5).
CEVALE2VE	Non profit organization	http://www.cevale2ve.org	Virtual organisation	Virtual organisation	Advisory role, networking & dissemination	CEVALE2VE works towards creating a modern academic environment to stimulate physics' students to consider a career in scientific research while informing them about study opportunities and possible career paths in research. Their tools are mainly online courses, webinars as well established e-learning programs. Members of CEVALE2VE are playing leading roles in LA-CoNGA Physics and they will work support the project on the e-learning platform (WP1) and the promotion the project activities within their network of contacts (WP5).
FrontierX Analytics Medellín	Private company/startup	http://frontierx.co/	Medellín	Colombia	Student mobility, Advisory role, networking & dissemination	FrontierX is devoted to offering Artificial Intelligence (AI) consultancy services across a variety of industry sectors, from finance, to aerospace, to transport, to supply chain management, among others. FrontierX will host students for 3-month internships in the context of the mobility scheme (WP3); will also offer know-how on using standard AI software tools lectures related to AI and Data Analytics (WP3); and disseminate project activities within our network of contacts (WP5).
DBAccess Perú	Private company/startup	http://www.dbaccess.com/	Lima	Perú	Student mobility, Advisory role, networking & dissemination	DBAccess expertise lies in application development, collaboration services, IT consulting and business process outsourcing. offices in Venezuela, Peru, Chile, Brasil, US and Italy. DBAccess will host students for 3-month internships in the context of the mobility scheme (WP3); will provide output to to enhance the adequacy of the private sector needs (WP3) and disseminate project activities within our network of contacts (WP5).

CAEN	Large scale company	https://www.caen.it/			Training, Advisory role, networking & dissemination	CAEN is the only company in the world providing a complete range of High/Low Voltage Power Supply systems and Front-End/Data Acquisition modules which meet IEEE Standards for Nuclear and Particle Physics. CAEN will provide expert support and training during the design and installation of the instrumentation labs in each HEI (WP2); will host students for 3-month internships in the context of the mobility scheme (WP3); will provide output to to enhance the adequacy of the private sector needs (WP3) and disseminate project activities within our network of contacts (WP5). CAEN brings the experience acquired in more than 35 years of collaboration with the High Energy & Nuclear Physics community into the University educational laboratories.
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PART G – Impact and Sustainability

G.1 Expected impact of the project

Please explain which target groups will use the project outputs /products /results. Describe how the target groups will be reached and involved during the life of the project and afterwards and how the project will benefit the target group at local, regional, national and/or regional level. Please structure your description according to the different levels of impact and stakeholders.

#	Project results	Who will they impact at national, regional level?	How?
1	e-learning platform and remote instrumentation HEP laboratories	Teaching staff, Technical staff, Students and school students.	They will be introduced to modern ITC platforms and tools never used in any of the partner countries. These novel infrastructures will enable new collaborative methodologies in the Partner HEIs. The teaching methods will be updated to include the e-learning technologies and the use of the connected scientific instruments in the laboratories.
2	Up-to-date contents for modular and flexible courses-ware and Lab experiences in HEP	Teaching staff, Technical staff, Program Students and school students.	Teachers and technical staff will acquire new digital skills to manage and create contents for the e-learning platform. Students, school students will be exposed to cutting-edge experimental infrastructures and a variety of concepts and techniques not found in standard textbooks.
3	Virtual research and learning community (VRLC)	Teaching staff, Technical staff, Program Students, school students.	Virtual collaborative environments, remote access to Lab infrastructure, complemented with international mobility will build a multi-institutional community, that will operate as in a single, common program. Not only courses will be shared; assignments and projects will be developed in multi-country teams.

4	Regional cooperative network of LA Institutions	Teaching staff, Technical staff, Administrative Staff and Program Students,	Teaching staff, Technical staff, Administrative Staff and Students will be part of a multidisciplinary network with colleagues in academia and industry both in Latin America and Europe. Administrative staff will acquire new digital skills and collaborative methodologies to manage other (networked) programs that could emerge and benefit from this experience.
5	LA-EU cooperation	Teaching staff and Program Students	Students and professors will have a unique opportunity to interact with their fellows in Latin America and experts in Europe helping to a rapid internationalization of the university with the strengthening of the present and future collaborations.
6	EU higher education model	Teaching staff and Program Students	The structure of the Curriculum and the opportunities offered to students (e.g. instrumentation and IT practices at home and internships with international mobility) will naturally mimic the structure used in EU universities.
7	Mobilisation of stakeholders including teachers, learners, economic and social partners	Teaching staff and Program Students	Students will perform internships in academic and/or non-academic institutions in Europe and/or in the Latin American Partner HEIs. The mobilisation of teachers will also be promoted through the consortium meetings and network schools.
8	people-to-people contacts, intercultural awareness and understanding.	Teaching staff and Program Students	Video conferencing environments develop virtual face-to-face relationships to ensure teacher immediacy and student social presence while the international mobility scheme to promote the people-to-people contacts and the intercultural awareness and understanding.

9	Skills and expertise beyond the HEP Master program	Teaching staff, Technical staff, Students and school students.	Topics like advanced coding, programming, machine learning, artificial intelligence, and advanced electronic instrumentation will be an essential part of the program. Industrial associated partners, like DBAccess and FrontierX, will provide students internships.
10	STEM Talent Pipeline	Teaching staff, Program Students, school students and General Public	General Public, primary and secondary students will be exposed to the most challenging fields of scientific research through citizen science projects.

Overview of short term impact indicators (during the project EU funding period)

Short term impact	Target groups/potential beneficiaries	Quantitative indicators (in numbers please)	Qualitative indicators
Instrumentation	technicians teachers students	1 test bench per partner HEI will be installed Material and documentation.	Satisfaction surveys by students and technicians.
e-learning	teachers students	Install material (computing, audio-visual) in the teaching rooms dedicated to the project. Ensure as close to 1GBps connectivity in all partner HEIs as possible.	Quality of access to the e-learning platform, to the teaching document, sharing of documents and results. Satisfaction surveys by students and teachers.
Courses	students	Success rates as close to 100% as possible Increase in the number of students after the first year of the program.	Satisfaction surveys by students and teachers.
Network Schools	teachers students	Presentation of results from the internships, from the data challengers	Satisfaction surveys by students and teachers.
Mobility scheme	students	90 days of mobility for the most distinguished students	Written reports at the end of the internships,

		(2 to Europe, 2 to another partner HEI per year)	presentations in the NS.
Citizen science	HS students	Installation and operation of small detectors in nearby High Schools.	Satisfaction surveys.

Please insert rows as necessary

Overview of long term impact indicators (after the projects EU funding period)

Long term impact	Target groups/potential beneficiaries	Quantitative indicators (in numbers please)	Qualitative indicators
Sustainable continuation of the Masters in HEP in all the partner HEIs.	Students, Partner HEIs	Partner HEIs maintaining a successful Master program in HEP. Increase in number of enrolled students.	Increased attractiveness of studies in basic sciences.
Double Master diplomas among Partner HEIs in Latin America and with program HEIs in Europe.	Students, Partner HEIs	Number of Double-diploma agreements signed. Increase in number of enrolled students, including in exchange from other partner HEIs and other HEIs in Latin America.	Increased attractiveness. Increased student mobility.
Future Schools, within the Network and beyond.	Students, teachers.	Increase in the number of registrants.	Increased attractiveness.
Usage of the e-learning platform and tools for teaching in other areas.	Students, teachers, Partner HEIs	Number of new virtual communities (other than HEP) implementing e-learning tools in their academic offering.	Increased attractiveness. Increased student mobility. Improved sustainability of the VRLS approach.

G.2 Dissemination and exploitation strategy

Please explain how the dissemination will be organised during and after the project's lifetime. Define each target group and what communication channels will be used to reach them and when.

Target Group	Means of Communication to Reach These Target Groups	When	Indicators to measure the effectiveness of the means of communication
University students	Online and recorded classes, other videos (tutorials, seminars), documentation in the e-learning. Dedicated seminars in their respective institutions. Local printed and social media.	During all the duration of the project and after, thought the permanent master program that will remain in each of the institutions.	Because most of the students in the program will be formal students, we will have official records of their participation, rates of success and development during and after the master program. Metrics in the number of visits, bound rates, views and download of the resources.
High Schools students	Public and dedicated seminars and events where students are invited to the university institutions, or local visits. Similar to what is done by the well known IPPOG Masterclasses	During all the duration of the project and after, thought periodic seminars and annuals sciences and outreach events.	We will perform a review of the number of assistants to those events. Keeping contact with their teachers to know the number of students.
Professors and trainers	Seminars and specific courses for the current local personnel and prospects of people to join. Or those who want to replicate similar efforts. Local printed and social media.	During all the duration of the project and after, thought the permanent training process to get personal. And annuals sciences and outreach events.	Similar to the students enrolled in the masters, the training and seminars will be in a formal context. Keeping a record and follow-ups of the assistants
General public	Public seminars, dedicated conferences in public events and press articles in online and printed publications. Local printed and social media.	During all the duration of the project and after, thought periodic seminars and annuals sciences and outreach events. Periodic Social Media engage posts and discussions.	In many cases, the metrics is the number of visits, bound rates, views and download of the resources in the online media and networks.

Policy-makers and organisations	Dedicated seminars and meetings to refer subjects like "Research-driven education" and "VRLC at the universities" models and their impact in the current and future economics.	During all the duration of the project and after, thought periodic and private seminars and annuals sciences and outreach events.	Looking at the commitments and agreements reached with them or by them. Possible joint declarations to public media.
Other universities and institutions in the region	Online coverage of the program. Invitation to other institutions to local and remote events to learn more about the opportunities and ideas.	Periodic sciences and outreach events. Dedicated conferences to participate as presenters.	Follow-ups with those colleagues and partners in the institutions. Possible enrolments or other forms of students' engage.
Specialised scientific and educators communities	Reviewed papers, conferences' presentations, proceedings. Seminars in Scientific installations like the partners CERN & ICTP	Periodic scientific events. Dedicated journals. Annual related events.	-Feedback obtained in-site. in the number of downloads and conversations in the online platforms where the content is shared (like ORCID)

G.3 Sustainability

Explain how exploitation activities will ensure optimal use of the results within the project's lifetime and afterwards. Explain how the impact of the project will be sustained beyond its lifetime. Please list the outcomes that you consider sustainable and describe the strategy to ensure their long lasting use beyond the project's lifetime. Also explain how the results will be mainstreamed and multiplied at national/regional level. Describe the strategy foreseen to attract co-funding and other forms of non-EU support for the project.

Sustainable Outcomes	Strategy to ensure their sustainability	Resources necessary to achieve this	Where will these resources be obtained?
trainings for e-learning	Produce high-quality training documents, transfer knowledge to new technicians and staff	This will be partly funded through LA-CoNGA Physics. Additional maintenance can be achieved with local funding.	Local funding (not very resource-demanding if starting from the LA-CoNGA Physics outputs)
Have the partner HEIs become officially involved in large HEP projects	Use the LA-CoNGA Physics network (in particular with colleagues at CERN, DESY, IN2P3, IRFU,	Additional sustainability can be achieved by maintaining the activities of the	Local funding (not very resource-intensive if starting from the

	TUD, ICTP) to prepare contacts with the large HEP collaborations	network after the 3-year funding period.	LA-CoNGA Physics outputs)
Have other fields use the e-learning and build their own VRCLs	Invite colleagues from other fields to observe and discuss the added value of the LA-CoNGA Physics VRCL	Not resource-demanding (to be done locally within each HEI)	Not resource-demanding (to be done locally within each HEI)
have other HEIs in Latin America (not in this project) use our VRCL approach	Use network schools and other conferences to establish contact with new colleagues	Mobility grants to invite colleagues, to attend conferences in other institutes.	Depending on the specific context of each partner HEI, budget for attending conferences can be either inexistent or limited.

PART H - Other EU grants

Please list the **projects** for which the organisations involved in this application have received financial support from EU programmes.

Université Paris Diderot is beneficiary of 8 Erasmus+ Capacity Building programs, 1 Erasmus Mundus program, and 61 programs in H2020. Only the most relevant for this project (i.e. for laboratories or personnel in the Physics Department, and mostly in HEP or related areas) are listed in the Table below.

Université Paul Sabatier Toulouse is beneficiary of 8 Erasmus+ Strategic Partnership programs, and 6 H2020 programs in the last three years. Only the most relevant for this project (i.e. for laboratories or personnel in the Physics Department) are listed in the Table below.

Programme or initiative	Reference number	Beneficiary Organisation	Title of the Project
Erasmus Mundus Action 2	2013.5669/002-001-EM	Université Paris Diderot	NanoPhi
Erasmus+ Strategic Partnership	TBD	Université Paris Diderot	Frontiers
ERC-2017-AdG	788137	Université Paris Diderot	DAMIC-M: Unveiling the Hidden: A Search for Light Dark Matter with CCDs
ERC-2017-AdG	787399	Université Paris Diderot	SEISMAZE: Data-intensive analysis of seismic tremors and long period events: a new paradigm for understanding transient deformation processes in active geological systems
ERC-2015-StG	679937	Université Paris Diderot	MagneticYSOs: Interpreting Dust polarization Maps to Characterize the Role of the Magnetic Field in Star Formation Processes
ERC-2014-AdG	669288	Université Paris Diderot	SM-GRAV: Gravity, Holography and The Standard Model
ERC-2014-AdG	637503	Université Paris Diderot	PRISTINE: High precision isotopic measurements of heavy elements in extra-terrestrial materials: origin and age of the solar system volatile element depletion
ERC-COG-2018	817791	DESY	Precision Gravity: From the LHC to LISA
MSCA-RISE-2018	822070	DESY	Japan and Europe Network for Neutrino and Intensity Frontier Experimental Research 2
MSCA-ITN-2017-EJD	765048	DESY (Associate Partner)	Simulation in Multiscale Physical and Biological Systems
MSCA-ITN-2017-ETN	764850	DESY	Scattering Amplitudes: from Geometry to Experiment
ERASMUS+ 2017-1-IT02	36669	DESY	Innovative Team Teaching for Physics

ERC-STG-2015	678215	DESY	Differential Higgs distributions as a unique window to new Physics at the LHC
ERC-COG-2014	646623	DESY	Neutrinos and the origin of the cosmic rays
ERC-COG-2014	647995	DESY	Inflation in String Theory - Connecting Quantum Gravity with Observations
ERC-STG-2014	638528	DESY	New avenues towards solving the dark matter puzzle
MSCA-RISE-2014	645479	DESY	Europe-Japan Accelerator Development Exchange Programme
MSCA-RISE-2014	644294	DESY	Japan and Europe Network for Neutrino and Intensity Frontier Experimental Research
MSCA-ITN-2014-EJD	642069	DESY (Associate Partner)	High Performance Computing in Life Sciences, Engineering And Physics
MSCA-ITN-2014-ETN	641789	DESY	Molecular Electron Dynamics investigated by Intense Fields and Attosecond Pulses
COST Action	CA16108	Technische Universität Dresden (Partner)	Vector Boson Scattering Coordination and Action Network
European Commission's Framework Programme 7 (FP7)	283487	Technische Universität Dresden	Discover The COSMOS
Erasmus	598910	UAN	MIMIR ANDINO
H2020	641998	UAN	REMEB
Erasmus+	598817	Technische Universität Dresden	EEIHSR
Erasmus+	586225	Technische Universität Dresden	ENTEP
Erasmus+	586468	Technische Universität Dresden	JOVITAL
Erasmus+	590200	Technische Universität Dresden	TEFCE
Erasmus+	574173	Technische Universität Dresden	DAMOC
EPP-1-2015-1-CO-EPPKA2-CBHE-JP	561754	Universidad Nacional Mayor de San Marcos (Associate Partner)	ACACIA
H2020-MSCA-IF-2014	654175	Université Paul Sabatier	HNSKMAP: High-order Numerical Schemes for Kinetic Models with Applications in Plasma Physics

H2020-INSO-2015	693210	Université Paul Sabatier	FabSpace 2.0: The Fablab for geodata-driven innovation - by leveraging Space data in particular, in Universities 2.0
EAC-A05-2017	400597999	Université Paul Sabatier	PULSE - Professionnalisation et ouverture à l'international de licences scientifiques expérimentales en Afrique de l'Ouest

Please insert rows as necessary.

*Please list **other EU grant proposals** submitted by your organisation, or by any partner organisation in this project proposal. For each grant application, please mention the EU Programme concerned and the amount requested.*

Programme concerned	Beneficiary Organisation	Amount requested
7 x MSCA-ITN-2019	DESY	1,874,847€
FETOPEN-01-2018-2019-2020	DESY	1,512,890€
Widespread-03-2018 Twinning	DESY	163,738€
INFRAEOSC-05-2018-2019	DESY	953,550€
5 x ERC-STG-2019	DESY	7.970.125€
6 x MSCA-IF-2018	DESY	1.000.838€
Erasmus+ CBHE ca. 5 applications expected	Technische Universität Dresden	ca. 5. Mio. €
Erasmus+ SP ca. 2 applications expected	Technische Universität Dresden	ca. 0.9 Mio. €
MSCA -170 applications	Technische Universität Dresden	44.013.793,60 €
ERC – 80 applications	Technische Universität Dresden	123.991.775,00 €
ICT – 50 applications	Technische Universität Dresden	24.532.382,25 €
ECSEL – 14 applications	Technische Universität Dresden	5.171.666,09 €

SC7 – 1 application	Technische Universität Dresden	349.687,50 €
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Universidad San Francisco de Quito (USFQ)

Programme or initiative	Reference number	Beneficiary Organisation	Title of the Project
UNIVERSITEIT GHENT	5475	Universidad San Francisco de Quito USFQ	Biomaterials
UNIVERSITÉ DE BORDEAUX	999	Universidad San Francisco de Quito USFQ	Molecular and Materials Simulation
UNIVERSITE DE MONTPELLIER	10098	Universidad San Francisco de Quito USFQ	Development of methodology to get murines with humanized mitochondria through perifecundation mitochondria
NATURAL HISTORY MUSEUM	34	Universidad San Francisco de Quito USFQ	Increase knowledge of crystal frogs
UNIVERSITÉ DE TECHNOLOGIE TROYES	5424	Universidad San Francisco de Quito USFQ	Study of the propagation of light in complex materials
UNIVERSITE DE MONTPELLIER	5501	Universidad San Francisco de Quito USFQ	Initiation of the Mito-Act Research Consortium, Mitochondria as a therapeutic agent in Immune-Regulation, Tissue Repair and Fertility
UNIVERSITÉ DE TECHNOLOGIE TROYES	5425	Universidad San Francisco de Quito USFQ	Electromagnetic model for the propagation of light in periodic structures.