

Latin American Strategy for Large-Scale Research Infrastructures for Particle Physics and Cosmology (next steps)

A MULTI-NATIONAL SCIENTIFIC COMMUNITY BASED EFFORT

XII SILAFAE 2018

OUTLINE

- Science benefits
- Current Participation in Large-scale Research Infrastructures
- Reference strategies: P5, EPPS, ESFRI
- LA Strategy

Benefits of large international science collaborations

It is widely recognized that large-scale long-term science collaborations deliver lasting benefits to participating nations.

- Major advances of knowledge and real hubs of knowledge
- Building science capability and science leadership
- Technology advances and tech transfer to industry
- Stronger and broader opportunities for STEM education, creating new pathways to the forefront of global science and research
- Outreach to communities about benefits of science and impact outside physics.

LANDSCAPE ANALYSIS

List of currently documented experiments and facilities in/with Latin American participation:

Cosmology and Gravitation

- LIGO, QUBIC
- DES/DESI/LSST/SDSS

Collider

- ATLAS, CMS
- LHCb, ALICE

Astroparticles

- AUGER, LAGO
- HAWC, ALPACA,SGSO

Neutrinos

- DUNE
- NOvA

Facilities

- ANDES
- LNLS:SIRIUS

Website: <https://sites.google.com/view/lastrategyforum/home>

AT THIS STAGE INTENDED TO DOCUMENT NOT TO PRIORITIZE

Structure of Scientific Briefs



MAIN CONSIDERATIONS FOR DEVELOPING A STRATEGY

Many of these experiments really are a global endeavor. Enhancing international alignment and participation is beneficial.

From the starting point of a clear mandate:

- An open community wide request for input and feedback is performed.
- Detailed and specific workshops to refine and identify science objectives and priorities.
- Roadmap with consideration to funding scenarios.
- Inclusion on non-regional contributions and perspectives.



Strategic Plan for US Particle Physics in the Global Context

P5 Report

Charge from DOE and NSF to Chair of HEPAP to set up P5 Panel and provide recommendations for priorities under 3 funding scenarios.

Ten year scale with 20 year vision

Report should include how major international projects can fit into the program

P5 Panel set up with international members (5/25)



PROCESS

Multiple activities to receive input from scientific community including younger scientists



Snowmass Study defined Science Drivers
HEPAP Workshops



Higgs physics, neutrino physics, dark matter, dark energy and inflation, the unknown



29 recommendations



US STRATEGY SUMMARY

Project/Activity	Scenarios			Science Drivers					Technique (Frontier)
	Scenario A	Scenario B	Scenario C	Higgs	Neutrinos	Dark Matter	Cosm. Accel.	The Unknown	
Large Projects									
Muon program: Mu2e, Muon g-2	Y, <small>Mu2e small reprofile needed</small>	Y	Y					✓	I
HL-LHC	Y	Y	Y	✓		✓		✓	E
LBNF + PIP-II	Y, <small>LBNF components delayed relative to Scenario B.</small>	Y	Y, enhanced		✓			✓	I,C
ILC	R&D only	R&D, <small>possibly small hardware contributions. See text.</small>	Y	✓		✓		✓	E
NuSTORM	N	N	N		✓				I
RADAR	N	N	N		✓				I
Medium Projects									
LSST	Y	Y	Y		✓		✓		C
DM G2	Y	Y	Y			✓			C
Small Projects Portfolio	Y	Y	Y		✓	✓	✓	✓	All
Accelerator R&D and Test Facilities	Y, reduced	Y, <small>some reductions with redirection to PIP-II development</small>	Y, enhanced	✓	✓	✓		✓	E,I
CMB-S4	Y	Y	Y		✓		✓		C
DM G3	Y, reduced	Y	Y			✓			C
PINGU	Further development of concept encouraged				✓	✓			C
ORKA	N	N	N					✓	I
MAP	N	N	N	✓	✓	✓		✓	E,I
CHIPS	N	N	N		✓				I
LAr1	N	N	N		✓				I
Additional Small Projects (beyond the Small Projects Portfolio above)									
DESI	N	Y	Y		✓		✓		C
Short Baseline Neutrino Portfolio	Y	Y	Y		✓				I

TABLE 1 Summary of Scenarios A, B, and C. Each major project considered by P5 is shown, grouped by project size and listed in time order based on year of peak construction. Project sizes are: Large (>\$200M), Medium (\$50M-\$200M), and Small (<\$50M). The Science Drivers primarily addressed by each project are also indicated, along with the Frontier technique area (E=Energy, I=Intensity, C=Cosmic) defined in the 2008 P5 report.

European Strategy for PP

Mandate from CERN Council

- *the Council will define and update the strategy based on proposals and observations from a dedicated scientific body that it shall establish for this purpose”.*

Preparatory Group

- Open approach to obtain scientific community input
- Open Symposium
- Product: Physics Briefing Book
- International members

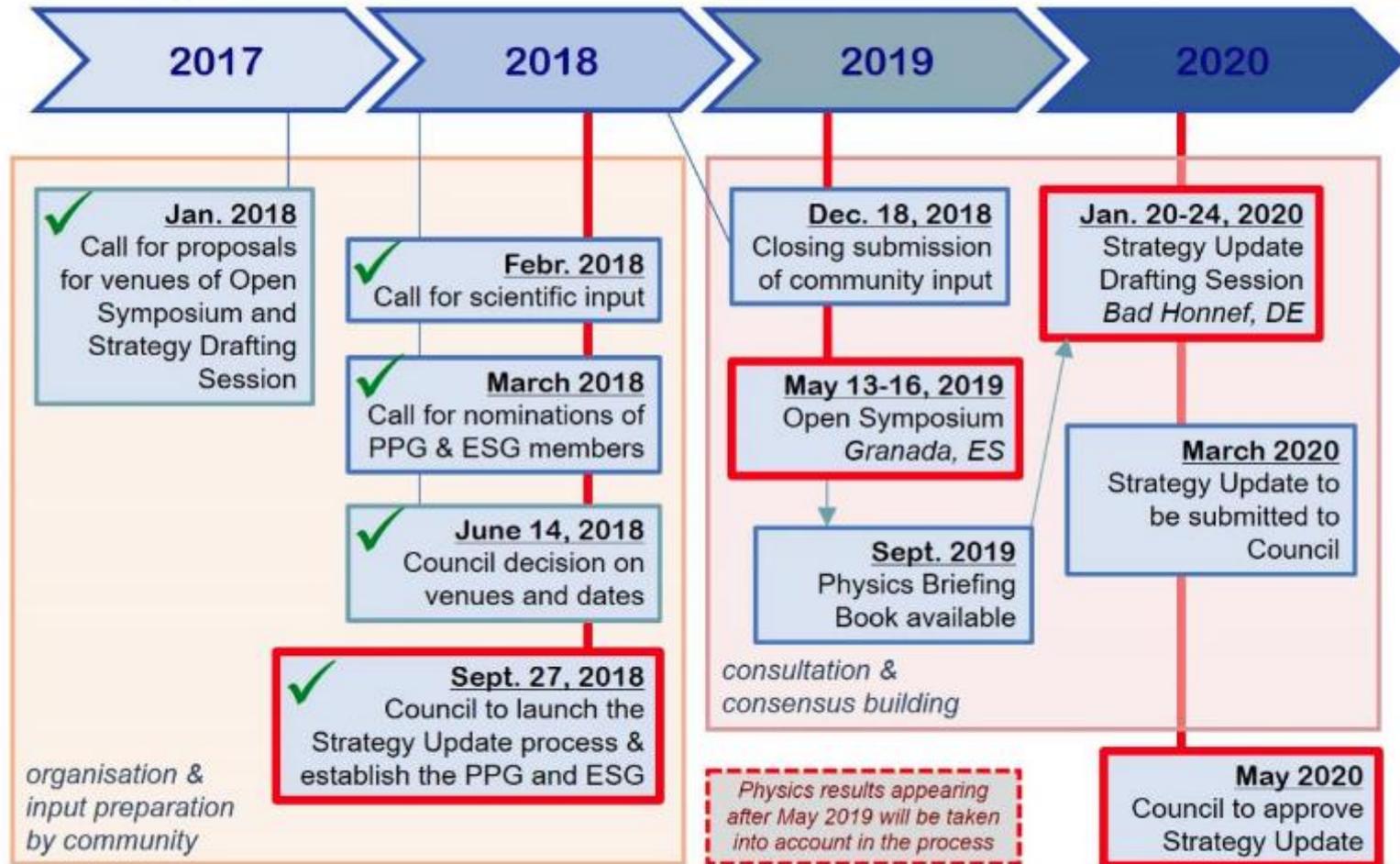
European Strategy Group

- Input Physics Briefing Book
- Series of meetings
- Large Composition from member states, observers, Major European Labs
- Also included EU, ApPEC, NuPECC, ESFRI, etc

European Strategy for PP



European Particle Physics Strategy Update



Timeline of the present European Strategy Update process with the green checkmarks symbolising the completed stages.

EUROPEAN STRATEGY FORUM FOR RESEARCH INFRASTRUCTURES



ROADMAP & STRATEGY REPORT

The European Strategy Forum on Research Infrastructures (ESFRI) periodically updates its Roadmap as mandated by the Competitiveness Council of the European Union to provide a coherent and strategic vision ensuring that Europe has excellent Research Infrastructures (RIs) in all fields of science and innovation^{1,2,3}.

ROADMAP FOR RESEARCH INFRASTRUCTURES IN DIFFERENT SCIENTIFIC DOMAINS INCLUDING PHYSICAL SCIENCES.

SINGLE-SITED RI

DISTRIBUTED-SITED RI

UPDATED STRATEGY AND ROADMAP FOR 2018.

ESFRI PROJECTS

ESFRI LANDMARKS

HIGH LEVEL IBEROAMERICAN MINISTERIAL MEETINGS FOR SCIENCE AND TECHNOLOGY



FERNANDO QUEVEDO, DIRECTOR OF ICTP, HAD THE OPPORTUNITY TO ADDRESS THE MINISTERS TO PRESENT THIS INITIATIVE FOR A LATIN AMERICAN STRATEGY FOR RESEARCH INFRASTRUCTURES IN PARTICLE PHYSICS AND COSMOLOGY

WITH SUPPORT FROM THE SCIENTIFIC COMMUNITIES: ARGENTINA, BRAZIL, CHILE, COLOMBIA, ECUADOR, MEXICO, PARAGUAY, PERU

SUPPORT FROM: CERN, FERMILAB, ICTP, VARIOUS MINISTRIES OF IB

HIGH LEVEL IBEROAMERICAN MINISTERIAL MEETING FOR SCIENCE AND TECHNOLOGY GUATEMALA 2018

DECLARATION

At the III Ministerial meeting of Science and Technology of Ibero-America, held 29-30 October in Guatemala a Ministerial Declaration included the need to further and support the scientific activities of researchers at existing infrastructures and the development of new ones, through specific mechanisms such as the Latin American Strategy Forum for Large Scale Research Infrastructures.

https://www.segib.org/wp-content/uploads/Declaracion-III-Reunion-de-Ministros-y-Altas-Autoridades-en-Ciencia-Tecnolog--a-e-Innovacion_ES.pdf

HIGH-LEVEL MEETING OF IBERO-AMERICAN HEADS OF STATE
NOV 15-16 2018 ANTIGUA, GUATEMALA

This document was further ratified at the High-Level Meeting of Heads of State held 15-16 November in Guatemala through the approval action plan, item C.7

<https://www.segib.org/wp-content/uploads/III-PROGRAMA-DE-ACCION.pdf>

MAIN CONSIDERATIONS FOR DEVELOPING A STRATEGY

Many of these experiments really are a global endeavor. Enhancing international alignment and participation is beneficial.

From the starting point of a clear mandate: ✓

NEXT STEPS

- An open community wide request for input and feedback is performed. SILAF AE, CALL FOR WHITE PAPERS.
- Detailed and specific workshops to refine and identify science objectives and priorities. First Workshop Sao Paulo April 29-30 2019.
- Roadmap with consideration to funding scenarios.
- Inclusion on non-regional contributions and perspectives.

Thank You

LASF FOR RI

To promote the establishment of the Latin American Strategy Forum (LASF) for Large-Scale Research Infrastructures starting with the fields of Particle Physics and Cosmology .

GOALS

- To build consensus and support a strategy-based approach for the participation in, and development of, large-scale research infrastructure projects in Particle Physics and Cosmology in Latin America.
- To make a call to Latin American scientific communities in Particle Physics and Cosmology to establish a strategic scientific forum in order to coordinate Latin American activities in the area.
- To set-up the LA scientific roadmap for Particle Physics and Cosmology based on actual participation in large-scale research infrastructures and the inherent need for long term planning and funding implementing an open call for input from the scientific communities.
- To enable a more effective development of Latin American research groups, facilitating multilateral participation in regional and global research infrastructures, increasing their impact.
- To inform the Ministerial meetings of the development, implementation and impact of the LA strategy for Particle Physics and Cosmology.