

# Latin American Strategy for Research Infrastructures for High Energy, Cosmology and AstroParticle Physics

**LASF4RI for HECAP**

A MULTI-NATIONAL SCIENTIFIC COMMUNITY BASED EFFORT

# Benefits of strategies of research infrastructure development

- Major advances of knowledge and real hubs of knowledge
- Fostering international scientific collaborations and science diplomacy
- 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.

# MAIN CONSIDERATIONS FOR DEVELOPING A STRATEGY

Research infrastructures can impact and benefit more when they are 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.

# TIMELINE

- NOVEMBER 2016 ICTP-SAIFR 5TH ANNIVERSARY (brainstorming)  
International Centre for Theoretical Physics – South American Institute for  
Fundamental Research  
<https://www.ictp-saifr.org/>
- November 2016 SILAFAE (discussions with HEP community)  
Simposio Latinoamericano de Fisica de Altas Energias
- 2017-2018 Two-page briefs of 18 experiments (landscape analysis)
- October 2018 Ministerial S+T meeting Guatemala (declaration mandate)
- December 2018 SILAFAE (Town hall meeting to discuss mandate and next steps)
- January-March 2019 National Meetings and conformation of Preparatory group  
delegates from 10 LA countries.
- April -May 2019 LASF4RI Workshop @ ICTP-SAIFR
- May 1 2019 First meeting of the Preparatory group (define planning)

# HECAP LANDSCAPE ANALYSIS

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

Gravitation and cosmology	<ul style="list-style-type: none"><li>• LIGO, QUBIC</li><li>• DES/DESI/LSST/SDSS</li></ul>
Colliders	<ul style="list-style-type: none"><li>• ATLAS, CMS</li><li>• LHCb, ALICE</li></ul>
Astroparticles	<ul style="list-style-type: none"><li>• AUGER, LAGO</li><li>• HAWC, ALPACA, SGSO</li></ul>
Neutrinos	<ul style="list-style-type: none"><li>• DUNE</li><li>• NOvA</li></ul>
Infrastructures	<ul style="list-style-type: none"><li>• ANDES</li><li>• LNLS:SIRIUS</li></ul>

Website: <https://lasf4ri.org>

AT THIS STAGE INTENDED TO DOCUMENT NOT TO  
PRIORITIZE

# Scientific Drivers (Current)

U.S.	Canada	Latin America
Use the Higgs boson as a new tool for discovery	What is the nature of physics at the electroweak scale and beyond?	X
Pursue the physics associated with neutrino mass	What is the nature of neutrino masses?	X
Identify the new physics of dark matter	What is the nature of dark matter in the universe?	
Understand cosmic acceleration: dark energy and inflation		X
Explore the unknown: new particles, interactions, and physical principles	What structures underlie the forces and matter in the universe?	x

# Presentation at the Meeting of the Science Ministers of Ibero-American countries in Guatemala in 2018.



30/ octubre 2018

III Reunión Iberoamericana de Ministros y Altas Autoridades de Ciencia, Tecnología e Innovación



Ministers+Heads of state approve creation of LSF4R and pilot projects.  
HECAP is a pilot project

# 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](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>**

## Declaración

### III Reunión de Ministros, Ministras y Altas Autoridades de Ciencia, Tecnología e Innovación

La Antigua Guatemala, 29 y 30 de octubre de 2018

Los Ministros, Ministras y Altas Autoridades en Ciencia, Tecnología e Innovación de los países iberoamericanos, reunidos en la ciudad de La Antigua Guatemala, los días 29 y 30 de octubre de 2018, en el marco de la XXVI Cumbre Iberoamericana de Jefes de Estado y de Gobierno.

13. Fomentar y coordinar la participación de investigadores e investigadoras iberoamericanos, de manera activa, en la investigación que se desarrolla en las infraestructuras internacionales existentes y el establecimiento de nuevas infraestructuras en la región, favoreciendo mecanismos que contribuyan a este propósito, entre ellos el establecimiento del Foro Estratégico Iberoamericano para las Grandes Infraestructuras científicas.

# LASF4RI---two prong approach

- **To promote the establishment of the Latin American Strategy Forum Research Infrastructures (LASF4RI)**
- **To spearhead the process for a specific field of knowledge 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 Latin America.
- To make a call to Latin American scientific communities to establish a strategic scientific forum in order to coordinate Latin American activities in the area.
- To set-up the LA scientific roadmap 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.

# COUNTRY LEVEL PLANNING

Ricardo Ingo Carlos Daniel Fernando  
Piegaia Allekote G.-Canal De Florian Monticelli

Teresa Xavier Ezequiel Hernan Alejandro  
Dova Bertou Alvarez Wahlberg Szykman

Construir el futuro sin  
importar si estaré en la foto!

**Astro-Cosmo-HEP@AR**  
**Feb 12, 2019**

Argentina's planning

# Latin America's planning



**LASF4RI Workshop**  
**ICTP-SAIJR, April 30-May 1 2019, Sao Paulo**

<http://www.ictp-saifr.org/workshop-on-the-latin-american-strategy-forum-for-research-infrastructure/>

# RESULTS OF 1st PG MEETING

1. Timeline and procedure of the open call to the community **for white papers defined with a deadline of December 1 2019.**
2. Include non-regional members in PG (invite 4 additional members), nominations until July 1st.
3. Preparatory Group Chair and Co-chair defined for a term of 1+1 year.
4. Establish the High level Strategy Group to validate the results of the Preparatory Group, with Chair and Co-chair defined, the other members will be decided on a two month scale by nominations until July 1st. Invitees from Research Councils, Cyted, Segib.
5. Next meeting of the Preparatory Group, after the closing of the submissions of white papers February 2020.

**PLEASE PARTICIPATE!!!!**

# Preparatory Group LA Members

**Argentina:** Diana López, Federico and Hernán Wahlberg

**Bolivia:** Martin Alfonso Subieta Vasquez

**Brasil:** Leandro de Paula, Thiago S Goncalves and Rogerio Rosenfeld

**Chile:** Alfonso Zerwekh and Mauro Cambiaso

**Colombia:** Marta Losada and Diego Restrepo

**Ecuador:** Lofti Boubekour, Harold Yepes Ramírez and Edgar Carrera

**Mexico:** Alfredo Aranda, Juan Carlos D'Olivo, Gerardo Herrera

**Paraguay:** Jorge Molina

**Peru:** Alberto Gago

**Venezuela:** Reina Camacho, Arturo Sanchez

**Europe:** Martijn Mulders

**US:** Marcela Carena and Marcelle Soares

**Asia:** Hiroaki Aihara

# HIGH-LEVEL STRATEGY GROUP MEMBERS

**COMPOSED OF THREE DIFFERENT SUB-GROUPS.**

- 1. PROMINENT SCIENTISTS OF THE REGION AND FROM AROUND THE WORLD.**
- 2. DIRECTORS OF INTERNATIONAL RESEARCH INSTITUTIONS LOCATED IN LATIN AMERICA**
- 3. REPRESENTATIVES OF THE LATIN AMERICAN RESEARCH COUNCILS/FUNDING AGENCIES**

# HIGH-LEVEL STRATEGY GROUP MEMEBERS

## First Subgroup: Scientists

**Argentina:** Maria Teresa Dova

**Brasil:** Joao dos Anjos

**Chile:** Claudio Dib

**Ecuador:** Bruce Hoeneisen

**Mexico:** Jacobo Konigsberg

**Venezuela:** Jose Ocariz

**Europe/CERN:** Peter Jenni

**Asia:** Hesheng Chen

**US:** Francis Halzen

**ICFA/Fermilab:** Pushpa Bhat

**Asia Pacific:** Geoffrey Taylor

## SECOND Subgroup: Institute Directors

Nathan Berkovits / ICTP-SAIFR

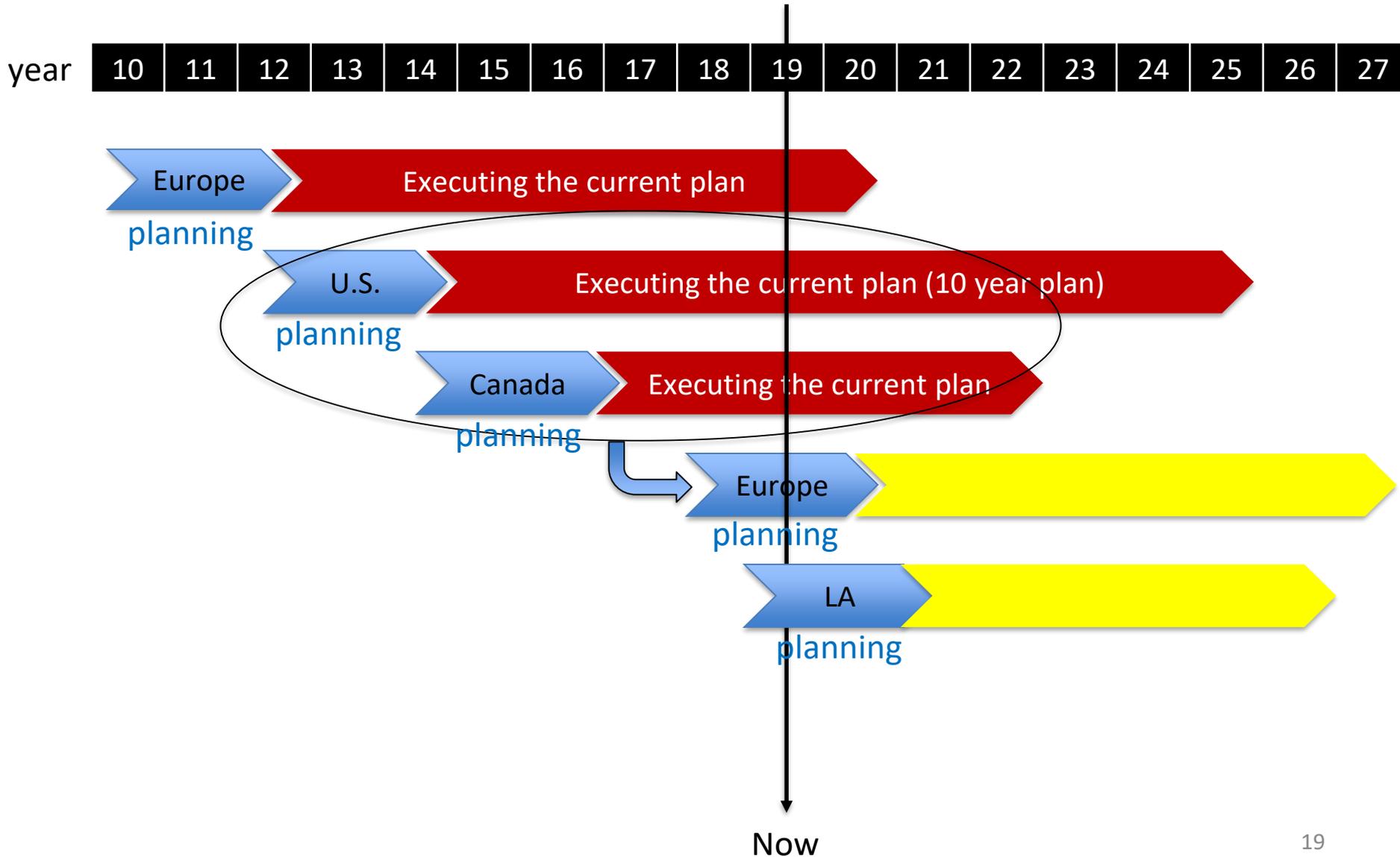
Daniel de Florian, ICAS

Alvaro Ferraz, IIP, Natal

Jose Roque, Sirius, LNLS

Carlos Trallero, CLAF

# Planning and Executing



GRACIAS

Website: <https://lasf4ri.org>

<https://cerncourier.com/a/european-strategy-enters-next-phase/>

European strategy

The ALPACA (Andes Large area PArticle detector for Cosmic ray physics and Astronomy) experiment is a new joint project between Bolivia and Japan, with the main purpose of observing cosmic gamma rays in the southern sky above 10 TeV with a wide field of view and high sensitivity.

"Southern Gamma-ray Survey Observatory (SGSO)" alliance has been founded end of 2017. Details can be found on the website of the alliance.

QUBIC is a cosmology project to study cosmic inflation by measuring the B-modes of the polarization of the Cosmic Microwave Background (CMB).

It uses [bolometric interferometry](#), which combines the advantages of interferometry (reduction of systematic errors) and those of the bolometer detectors (high signal sensitivity).<sup>[1]</sup> QUBIC observes the sky at two frequencies, 150 and 220 GHz, so that it can separate the cosmological signal from foreground emission, in particular thermal [dust](#) emission.