

# Latin American Strategy for HECAP

Marta Losada  
Chair of the Preparatory Group  
LASF4RI for HECAP

A MULTI-NATIONAL SCIENTIFIC COMMUNITY BASED EFFORT

COMHEP, December 2020

# Timeline

Brainstorming with the HEP community at ICTP-SAIFR 5th ann. and XI SILFAE in Guatemala

## Initial ideas

Nov.  
2016

## Initial landscape

Two-page briefs of 18 experiments.  
Gathering support from national communities.



Iberoamerican Science and Technology Ministerial meeting in Guatemala:  
mandate declaration

## Mandate

Oct.  
2018

## Town Hall

Town hall meeting at the XII SILFAE in Peru to discuss mandate and next steps



National Meetings and formation of the Preparatory Group with delegates from 10 LA countries.

## Preparatory Group

J/F/M  
2019

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# Timeline



Recognition of advances  
LASF4RI-HECAP  
process



**IB S+T  
Ministerial  
Meeting**



**High-Level  
Strategy Group**

Presentation of Strategy Document to the High-Level Strategy Group for HECAP

**Preparatory  
Group Meeting**

Next steps for the Preparatory Group and national processes for next cycle

# Preparatory Group Members

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

**Bolivia:** Martin Subieta Vasquez

**Brazil:** Thiago S Goncalves and Rogerio Rosenfeld

**Chile:** Alfonso Zerwekh and Mauro Cambiaso

**Colombia:** Marta Losada and Diego Restrepo

**Ecuador:** Edgar Carrera and Harold Yepes Ramírez

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

**Paraguay:** Jorge Molina

**Peru:** Alberto Gago

**Venezuela:** Reina Camacho, Arturo Sánchez

**Europe:** Martijn Mulders

**US:** Marcela Carena and Marcelle Soares

**Asia:** Hiroaki Aihara

## Observers

Leandro de Paula, Brazil

Recently groups from **Guatemala, Honduras**  
**Costa Rica** building a CA effort represented  
today by Ma. Eugenia Cabrera and Melissa  
Cruz.

# HIGH-LEVEL STRATEGY GROUP MEMBERS

Luciano Maiani – Chair  
Fernando Quevedo - Co-Chair

## Country/Regional Scientific Representatives

**Argentina:** Maria Teresa Dova

**Brazil:** 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/Gabriela  
Gonzalez

**ICFA/Fermilab:** Pushpa Bhat

**Asia Pacific:** Geoffrey Taylor

## Institute Directors

Nathan Berkovits, ICTP-SAIFR

Daniel de Florian, ICAS

Alvaro Ferraz, IIP

Jose Roque, LNLS

Ignacio Bediaga, CLAF

Luis Felipe Rodriguez, MAIS

# AstroParticles/Cosmology

- ALPACA
- LAGO
- AUGER
- HAWC
- DarkSide
- DAMIC
- TOROS/ABRAS
- QUBIC
- BINGO
- LLAMA
- LSST
- ASTRI
- CTA
- SWG0
- SAGO

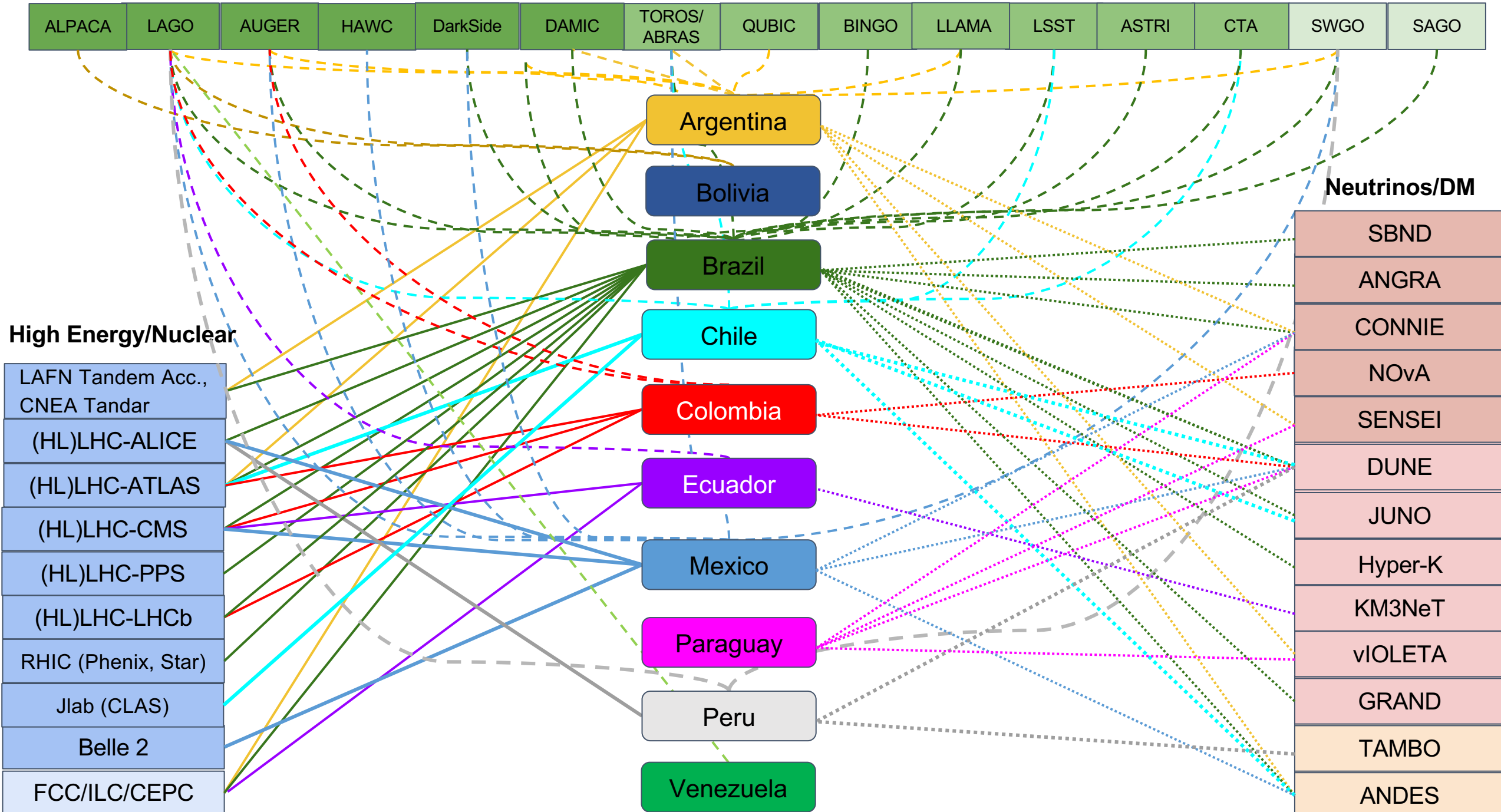
- Argentina
- Bolivia
- Brazil
- Chile
- Colombia
- Ecuador
- Mexico
- Paraguay
- Peru
- Venezuela

# Neutrinos/DM

- SBND
- ANGRA
- CONNIE
- NOvA
- SENSEI
- DUNE
- JUNO
- Hyper-K
- KM3NeT
- vIOLETA
- GRAND
- TAMBO
- ANDES

# High Energy/Nuclear

- LAFN Tandem Acc., CNEA Tandar
- (HL)LHC-ALICE
- (HL)LHC-ATLAS
- (HL)LHC-CMS
- (HL)LHC-PPS
- (HL)LHC-LHCb
- RHIC (Phenix, Star)
- Jlab (CLAS)
- Belle 2
- FCC/ILC/CEPC



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# **Latin American Strategy Forum for Research Infrastructures for High Energy, Cosmology, Astroparticle Physics LASF4RI for HECAP**

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## **Latin American Strategy for HECAP** Proposal submitted to the High Level Strategy Group

### **Strategy Document Committee**

Alfredo Aranda, Diana López Nacir, Marta Losada, Rogerio Rosenfeld,  
Arturo Sánchez, Federico Sánchez, Harold Yepes Ramirez

### **Preparatory Group**

**ARGENTINA:** Diana López Nacir, Hernán Wahlberg, Federico Sánchez  
**ASIA-JAPAN:** Hiroaki Aihara  
**BOLIVIA:** Martin Subieta  
**BRAZIL:** Thiago Goncalves, Rogerio Rosenfeld  
**CHILE:** Mauro Cambiaso, Alfonso Zerwekh  
**COLOMBIA:** Marta Losada, Diego Restrepo  
**ECUADOR:** Edgar Carrera, Harold Yepes Ramirez  
**EUROPE-CERN:** Martijn Mulders  
**MEXICO:** Alfredo Aranda, Juan Carlos D'Olivo, Gerardo Herrera  
**PERU:** Alberto Gago  
**PARAGUAY:** Jorge Molina  
**USA:** Marcela Carena, Marcelle Soares-Santos  
**VENEZUELA:** Reina Camacho Toro, Arturo Sánchez

**Date:** October 1, 2020



# Summary of Recommendations

Four major recommendations with regard to HECAP research infrastructures:

- Ensure a rich program of astro/astroparticle/cosmo experiments in the region *with enhanced participation of LA*.
- Develop on >10 year scale new facilities and areas of expertise in the region (**underground physics, gravity, neutrino astronomy**).
- Continue strong links and participation in major international projects in collider and neutrino physics *via a more focused, coordinated and impactful approach*.
- Maintain a balanced approach including smaller scale regional projects to drive new ideas and technological developments.

Five recommendations to strengthen the HECAP science program as a whole:

- R&D technologies
- Advanced training program
- Connections between theorists and experimentalists
- Computing and network infrastructures
- Societal engagement

**One major recommendation** for stability and continuity mechanisms in funding and cooperation across funding agencies in LA.

# Endorsement by the High-Level Strategy Group

- **HLSG Meeting of Oct 20 2020**

After reviewing and discussing this document the HLSG wishes to express that it applauds the process that has been undertaken in Latin America for the *first time* to develop with broad participation of the HECAP scientific community a strategy for research infrastructures. The research topics combine an exciting contribution to understand the deepest structures and fundamental interactions of our Universe with the latest technological developments and with concrete applications to society. The resulting documents reflect an in-depth and systemic exercise to understand the current landscape, identify the regional strengths and weaknesses, and propose concrete projects to focus on while maintaining a balanced perspective that includes crucial capacity building initiatives.

The **LASF4RI-HECAP Strategy Document** presented to the HLSG shows an impressive degree of maturity of the Latin American region in moving forward with participation and leadership roles in state of the art large research infrastructures and related experimental facilities in HECAP areas. Its pillars are *ten* overarching recommendations whose successful implementation could lead to significant improvement of the impact of, and benefit for, the Latin American region in technological and scientific development in the near and medium term future. The findings and recommendations define the priorities for Latin American scientists in the coming decade and beyond.


# Endorsement by the High-Level Strategy Group

- The endorsement recognizes the major recommendations:


- The abundance of rich projects in the area of Astro/Cosmology located in Latin America that are ongoing or under construction, as well as future initiatives, demonstrate the unique regional strengths and potential that should be most strongly supported. An increased participation from regional groups in these projects is highly desirable to help position them in prominent leadership roles and also benefit the younger generations of Latin American scientists.
- The opportunity to incursion into underground physics experiments in a big way with the development of the ANDES facility should be a high priority for the region. This would require a well coordinated and sustained commitment across Latin American countries to ensure its success and to position the facility on the global scale.
- The participation in international large-scale collaborations in both collider and neutrino physics experiments have been a key driver in the Latin American region. It has facilitated building-up and consolidating experimental research groups in the region, which in many cases have taken on leading roles in some of these flagship projects. These activities should be most strongly supported to continue the advancement and future leadership in HECAP experiments and related large infrastructure facilities, providing younger generations with the best training capabilities and opportunities at the global scale.
- Small and mid-scale regional projects of high scientific and technological impact can provide unique opportunities to the region to be innovative and assume leadership and should be supported with high priority. These local infrastructures also provide excellent opportunities for training and R&D, and can be stepping stones for larger projects with strong participation of LA scientists.

# Endorsement by the High-Level Strategy Group

The **LASF4RI-HECAP Strategy Document** addresses several aspects that need to be simultaneously developed to sustain a thriving research environment which includes fostering R&D for key technologies, enhancing the computing and network infrastructures, advanced training of the younger generations, and broad dissemination of knowledge with increased initiatives for citizen science. The importance of reinforcing connections between theorists and experimentalists to advance the research questions posed and the exploration of answers through experimentation is clearly stated and is considered of great value by the HLSG.



The recommendation for stable and continuous mechanisms for funding and coordination at the level of funding agencies and research councils for HECAP is of paramount importance and this HLSG endorses it enthusiastically.



Finally, the HLSG strongly recommends that the HECAP community put in place a robust structure and mechanisms that would allow the community to come together, on a periodic basis, ideally about every five years, to examine progress and consolidate community input to develop and/or update the strategic plan for the region. The European Particle Physics Strategy Update and the United States “Snowmass” processes are examples of successful national/regional models. Such sustained and recurring community engagement in the strategy development process will ensure regional coordination in the participation, as well as in developing leading roles, in regional and global scientific research infrastructures. This would also facilitate funding agencies in their decision-making process to adequately support the HECAP efforts in Latin America.



**Given the above considerations the High Level Strategy Group expresses its endorsement of the 2020 LASF4RI-HECAP Strategy Document.**

# Representatives of funding agencies/research councils of LA countries

Juan Pablo Paz - Ministry of STI Argentina

Roberto Rivarola – CONICET, Argentina

Ingo Allekotte - CNEA, Argentina

Claudia Mendes de Oliveira – FAPESP, Brasil

Ron Shellard - delegate of Ministry of STI, Brazil

Andrés López – ANID, Ministry of STI, Chile

Luis Chavarría – ANID, Ministry of STI, Chile

Eulalia Banguera – Ministry of STI, Colombia

Benjamín Marticorena – Concytec, Peru

Pio Arias – delegate of Venezuela

Mexico presented excuses and will be informed of outcome.

Félix García Lausín - Representative of SEGIB

# Iberoamerican S+T Ministerial Meeting

- [https://www.segib.org/wp-content/uploads/Declaracion-IV-RMCTI\\_ES.pdf](https://www.segib.org/wp-content/uploads/Declaracion-IV-RMCTI_ES.pdf)

Los avances en el establecimiento del Foro Estratégico Iberoamericano para las Grandes Infraestructuras, a partir del desarrollo de un programa piloto en el área de física de altas energías, astropartículas y cosmología, cuyos resultados se han plasmado en el documento estratégico para el desarrollo de estas disciplinas, que incluye la definición de recomendaciones y el establecimiento de una hoja de ruta.

GRACIAS!