Broader LA Perspective:

The Latin American Association for High Energy, Cosmology and Astroparticle Physics LAA-HECAP

Rogerio Rosenfeld (IFT-UNESP/ICTP-SAIFR)

Two main community efforts in HECAP in Latin America:

- Latin American Symposium in High Energy Physics (SILAFAE)
- Latin American Strategy Forum for Research Infrastructure (LASF4RI)

SILAFAE has a long tradition and it is the premier meeting of the High Energy LA community.

It takes place every 2 years in different countries in Latin America. XV edition happened in 2024 in Mexico City. XVI edition will be in Bogota in 2026.

The Latin American Strategy Forum for Research Infrastructure (LASF4RI) is a more recent effort: it aims at developing a strategy to strenghten the Latin American scientific collaborations and their impact.

Inspired by the Snowmass/P5 process in the US and the ESPP in Europe.

LASF4RI

lasf4ri.org

Latin American Strategy Forum for Research Infrastructure

Developing a strategy to strengthen Latin American Scientific Collaborations and their impact.

Main Goals of the Process

- To chart the landscape of existing infrastructure and expertise already developed in the region.
- 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 strategy for HECAP.

1st Strategic Planning in Latin America

Based on 39 white papers submitted by the community. Finished in 2021.

Three main documents produced:

- LA-HECAP Physics Briefing Book
- Strategy Document with recommendations
- Endorsement letter from HLSG

lasf4ri.org

arXiv:2104.06852v1 [hep-ex] 14 Apr 2021

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

LATIN AMERICAN HECAP PHYSICS BRIEFING BOOK

Preparatory Group

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Marcela Carena - Fermilab/U. of Chicago
Juan Carlos D'Olivo - UNAM
Thiago Goncalves - Valongo Observatory
Diana López Nacir - DF/IFIBA UBA-CONICET
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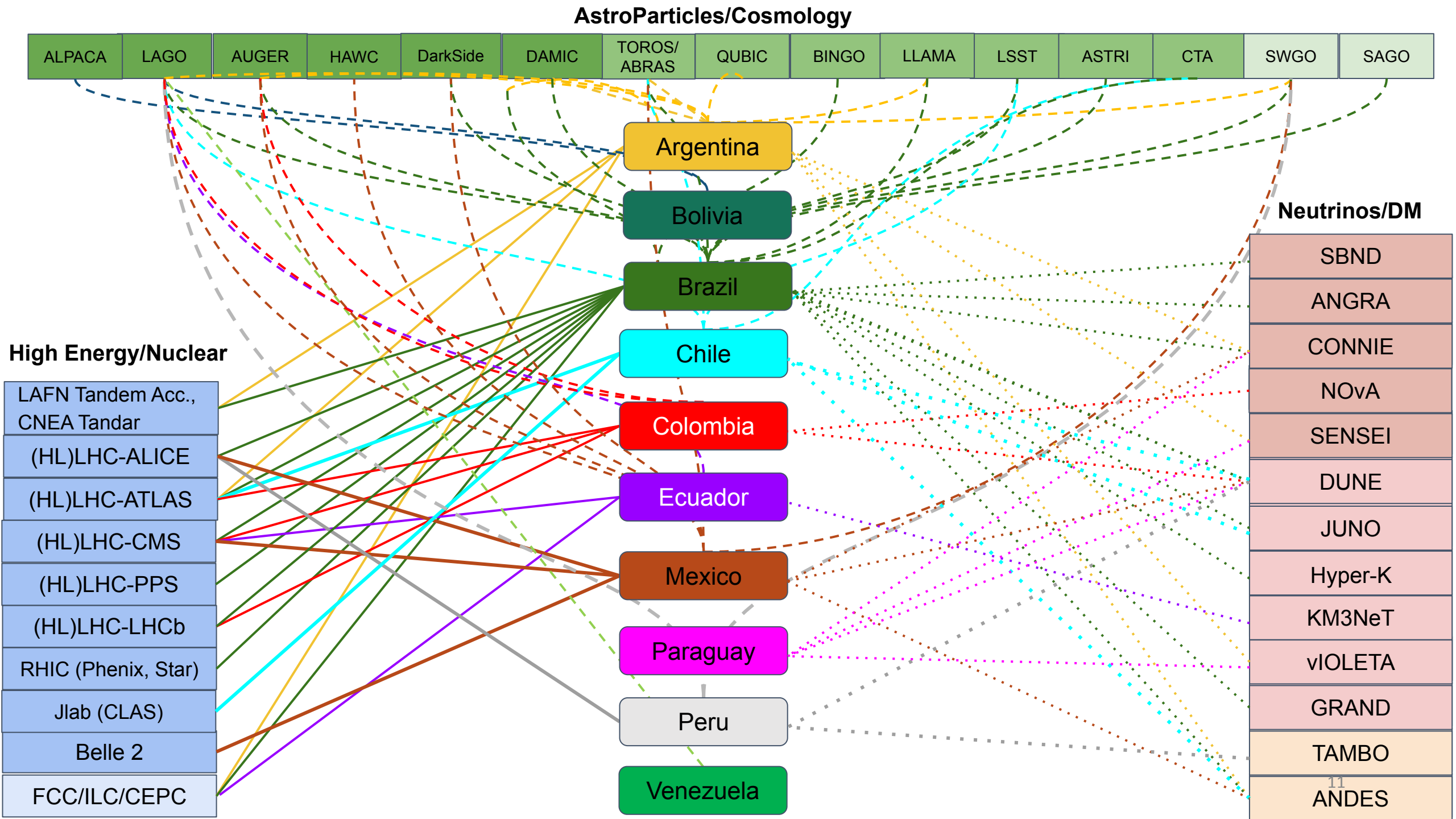
Very complex landscape revealed:


AstroParticles/Cosmology
ALPACA
LAGO
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Latin American Strategy Forum for Research Infrastructures for High Energy, Cosmology, Astroparticle Physics LASF4RI for HECAP

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

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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.

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Fernando Quevedo - Co-Chair

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Chile: Claudio Dib
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Under renewal process

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.

Following the recomendation to create a robust structure, LAA-HECAP was established during the SILAFAE XII¾ in November 2021 as an association for the Latin American research community in the fields of High Energy, Cosmology and Astroparticle Physics (HECAP).

The objectives of the organization were declared in the bylaws. The first General Assembly took place during the XIV SILAFAE in Ecuador in 2022 and the second GA happened in the XV SILAFAE in Mexico in 2024

Membership by just filling a Google Form. Anyone interested in HECAP can join. More 600 members registered!

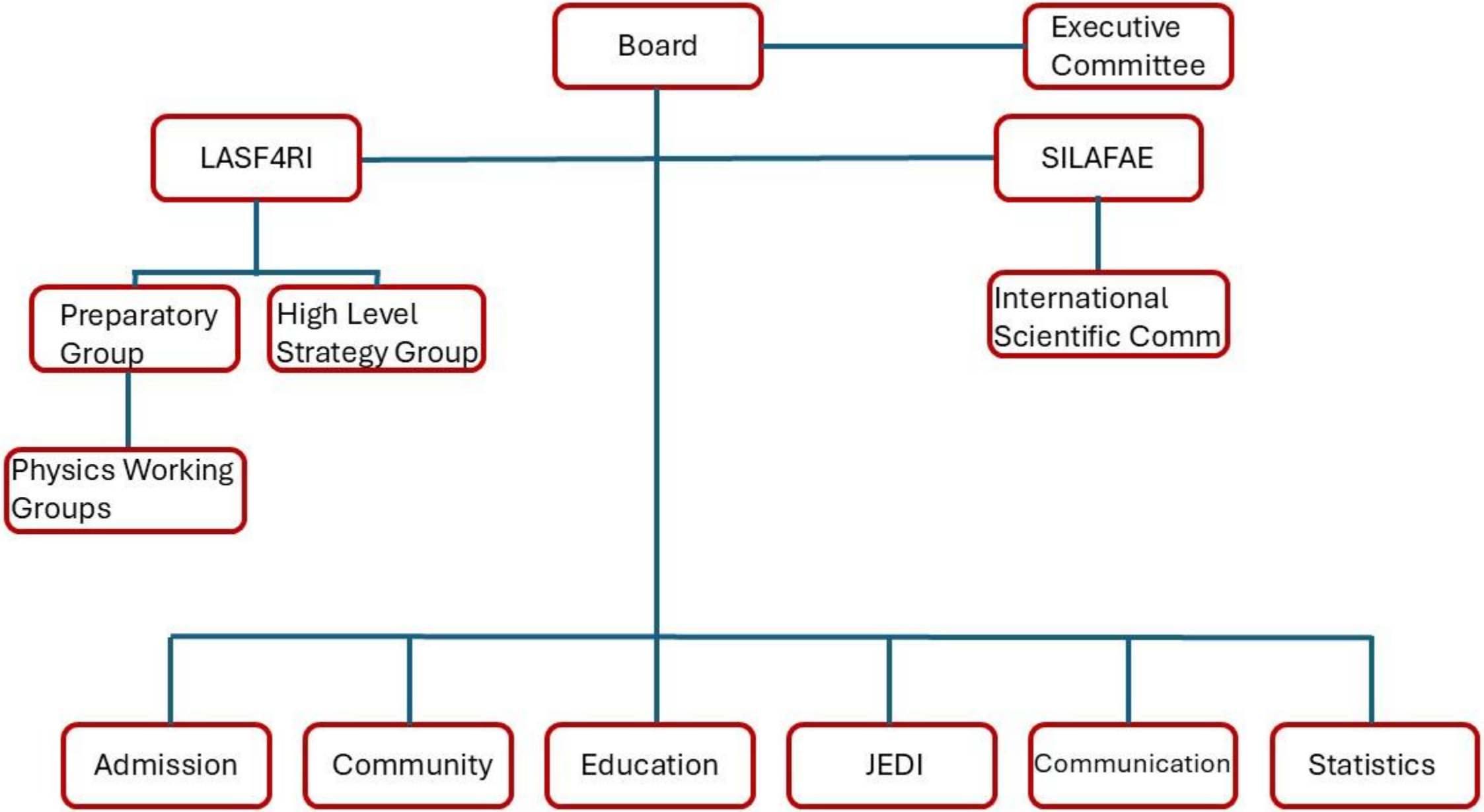
https://www.laa-hecap.org

The Latin American Association for High Energy, Cosmology and Astroparticle Physics (**LAA-HECAP**) was created in November 2021. It aims to leverage and amplify the successful and growing dynamics of research in HECAP in Latin America, as demonstrated by the fruitful and long-term organization of the Latin American Symposium on High Energy Physics (Simposio Latino Americano de Física de Altas Energias – **SILAFAE**) series and the recent initiative of strategic planning through the Latin American Strategy Forum for Research Infrastructures for HECAP (LASF4RI-HECAP), with the participation of several countries in the region. LAA-HECAP is hosted by the ICTP-South American Institute for Fundamental Research (ICTP-SAIFR).

LATIN AMERICAN ASSOCIATION FOR HIGH ENERGY, COSMOLOGY AND ASTROPARTICLE PHYSICS (LAA-HECAP)

LAA-HECAP is hereby established as an association of the Latin American research community in the fields of High Energy, Cosmology and Astroparticle Physics (HECAP). It aims to leverage and amplify the successful and growing dynamics of research in HECAP in Latin America, as demonstrated by the fruitful and long-term organization of the Latin American Symposium on High Energy Physics (Simposio Latino Americano de Física de Altas Energias - SILAFAE) series and the recent initiative to form a Latin American Strategy Forum for Research Infrastructures for HECAP (LASF4RI-HECAP - lasf4ri.org) with the participation of several countries in the region.

- Strengthen existing ties within the Latin American HECAP community and foster new and existing collaborations
- Engage the wider scientific community and the general public through the promotion of HECAP.
- Represent the Latin American HECAP communities in other scientific international bodies
- Announce activities in HECAP in the region through means such periodic newsletters and a website
- Promote other activities such as the organization of symposia, workshops, schools, university-institution cooperation and exchange programs for students, and the production of educational and outreach material
- Engage with Ministries, funding agencies and other national authorities related to Science and Technology to promote the rollout and development of the current LASF4RI-HECAP process.
- Organize SILAFAE (Latin American Symposium on High Energy Physics) every two years.
- Coordinate periodic assessment and strategic planning within the LASF4RI-HECAP process.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Update process of the HECAP Strategic Planning in Latin America

- Call for new or updated white papers was issued in November 2023 with a deadline for submission of July 26, 2024.

- The submitted contributions will be presented at the “III LASF4RI for HECAP Symposium: Update of the Strategic Plan“, held at ICTP-SAIFR in São Paulo in August 26-29, 2024, with the participation of the Preparatory Group, High Level Strategy Group, Funding Agencies and representatives of similar efforts around the globe.

LASF4RI-HECAP Preparatory Group 2024-2026

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José Antonio López
International
Juan Estrada (Fermilab)
Martijn Mulders (CERN)

III LASF4RI for HECAP Symposium: Update of the Strategic Plan

August 26 – 29, 2024

ICTP-SAIFR, São Paulo, Brazil

Slides and videos are available on the website www.ictp-saifr.org/hecap2024

Invited speakers:

- **Luciano Maiani** – chair of the LASF4RI High Level Strategy Group
- **Ricardo Galvão** – Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq, Brazil)
- **Sylvio Canuto** – Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP, Brazil)
- **Rafael Anta** – Banco Interamericano de Desenvolvimento (BID)
- **Sharapyia Kakimova** – Agencia Nacional de Investigación y Desarrollo (ANID, Chile)
- **Ana Patricia Torres** – Consejo Nacional de Humanidades, Ciencias y Tecnología (CONAHCYT, Mexico)
- **Federico Sanchez** – Comisión Nacional de Energía Atómica (CNEA, Argentina)
- **Enrique Pazos** – Secretaría Nacional de Ciencia y Tecnologia (SENACYT, Guatemala)
- **Martijn Mulders** (CERN)
- **Yifang Wang** (Institute of High Energy Physics – Beijing)
- **Christophe Grojean** (DESY & CERN)
- **Hitoshi Murayama** (University of Caligfornia – Berkeley)
- **Paris Sphicas** – chair of European Committee for Future Accelerators
- **Kétévi Assamagan** (Brookhaven National Laboratory)
- **Marta Losada** (New York University Abu Dhabi)

The process for the update of the Latin American Strategic Plan (details and documents can be found in lasf4ri.org) will continue with the preparation of updates of the landscape of LA participation in different experiments, of the Physics Briefing Book (PBB) and the Recommendations by the Preparatory Group (PG), all based on the received white papers (36) and with consultation with the High Level Strategy Group.

The PG will collect the material and may ask for additional information from the community in order to write a more comprehensive report. We plan to finish the work at the end of 2025.

Some highlights of LAA-HECAP activites:

- Mobility programs within Latin America (ICTP network program, CLAF/LAA-HECAP program); new project submitted to Simons Foundation submitted in Oct. 25;
- Member of LAA-HECAP nominated for the Preparatory Group of the ESPP;
- Submission of regional input to ESPP with information from a questionnaire;
- Nominations of LAA-HECAP representatives in C11 and ICFA
- Update of the Latin American Strategy in HECAP well under way
- ICHEP in Latin America for the first time in 2026

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CONCLUSIONS

- The High Energy, Cosmology and Astroparticle Physics (HECAP) Latin American community has experienced rapid growth;
- SILAFAE has been the forum for discussions in HECAP in LA since 1996;
- A first bottom-up Strategy Planning in HECAP in Latin America was done by LASF4RI in 2019-2020 which revealed a rich landscape;
- Community created LAA-HECAP in 2020 to coordinate efforts in the region;
- Many results already reached: mobility programs within LA, visibility in HECAP for LA (ICHEP in LA, representatives in committees), …
- An update of the Strategy Planning in full swing;
- An engaged HECAP community in LA is being developed and organized. Let's keep the effort going!

1. LAA-HECAP obtained two 6-months grants from the ICTP Network program (5k euros each). Two calls were issued and the following visits were selected by the Executive Committee:

First call (visits until December 2023)

- Irina Nasteva (LAPE-IF-UFRJ, Brazil) Detector characterisation and data analysis of Skipper-CCDs Project for a scientific visit to the LAMBDA laboratory at DF-UBA (Argentina)

- João Paulo Correia de França - Brazilian Center for Research in Physics (CBP) to visit: Universidad Nacional de San Martín (UNSAM) Project: Classifying strong gravitational lenses in ground-based surveys: paving the way for deep learning applications

- Mario Guerra - Student at the School of Physical and Mathematical Sciences in Universidad de San Carlos de Guatemala. Visit Dr. Omar Gustavo Miranda of Centro de Investigación y de Estudios Avanzados del Instituto Politécnico Nacional. Project: Neutrino physics and its implications for physics beyond the Standard Model

Second call (visits until August 2024)

- Miguel Sofo Haro (Universidad Nacional de Cordoba and CONICET) to visit Irina Nateva (UFRJ). Project: Installation of the CONNIE experiment upgrade with Multi Skipper-CCD Modules.

- Facundo Lucca (IFLP-CONICET, La Plata) to visit Eduardo F. Simas Filho (Federal University of Bahia). Project: Integration of Ringer algorithm into the Global Event Processor firmware project.

- José Alberto Martín Ruiz (Instituto de Ciencias Nucleares-UNAM) to visit Mauro Cambiaso (Universidad Andres Bello, Santiago de Chile). Project: Exact solutions to axion electrodynamics

All reports of these visits are publicly available.

In addition, the LAA-HECAP / US-ATLAS Physics Education Outreach Program selected the following students to visit Brookhaven National Laboratory:

- Arthur Alves, an M.Sc. student at the Federal University of Bahia, an ATLAS-Brazil Cluster Institute member
- Oscar A. Altuve Pabón, MSc student at the Universidad Simón Bolívar (USB) - Venezuela

We also started a partnership mobility program with CLAF with US$10k for one year period. A joint CLAF and LAA-HECAP committee selected the following persons and projects:

Christian Sarmiento Cano
Postdoctoral research from Universidad Industrial de Santander in Colombia to visit Iván Sidelnik from the Centro Atómico de Bariloche
Project: Neutron Detection Using Water Cherenkov Detectors for Precision Agriculture Applications

Melissa Cruz
Professor from Universidad Nacional Autónoma de Honduras to visit Ignacio Bediaga from CBPF
Project: CP violation measurements in B->pph decays

Mario A. Acero Ortega
Professor from Universidad del Atlántico, Colombia, to visit Alexis Aguilar-Arevalo from UNAM, Mexico
Project: Neutrino Oscillations Data Analysis and Particle Detectors

Igo Amauri Dos Santos Luz
PhD student from Universidade Federal da Bahia in Brazil to visit Fernando Monticelli from Universidad de La Plata in Argentina
Project: Integration of the Neural Ringer algorithm into the ATLAS Global Event Processor firmware project

Luz Ángela García
Professor from Universidad ECCI in Bogotá, Colombia to visit Diana Lopez Nacir from UBA, Argentina
Project: Studying dark energy models with current cosmological observables

Matías Leizerovich
PhD student from UBA to visit Dr. Luisa Jaime from UNAM
Project: implement a parametrization at background level in the frame of the f(R) theories of gravity and evaluate its cosmological prediction

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