



Universidad Industrial de Santander Colombia and The International Doctorate Network in Particle Physics, Astrophysics and Cosmology (IDPASC)

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School of Physics

Universidad Industrial de Santander, Bucaramanga-Colombia

Where are we?

Universidad Industrial de Santander



Legado académico y cultural
de los santandereanos

Public Departamental University.
Students ~25000 pregraduates ~1000 graduates
Staff ~500 Faculty
Programs 120 Preg, 20 Masters, 11 Doctoral



Sede Barbosa

#LaUISqueQueremos

Who are we?

School of physics

Research areas:

- Optics
- Nanoscience
- Computational Physics
- Plasma Physics
- Biomaterials
- Geophysics
- Astrophysics & Cosmology



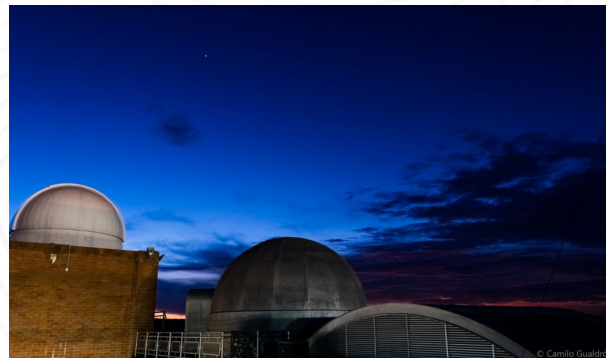
- 26 Staff
- 9 posdocs
- 154 undergraduates
- 53 graduates

#LaUISqueQueremos

Universidad
Industrial de
Santander



- **Master**
 - Physics
 - Geophysics
 - Applied Math
- **PhD in Physics**

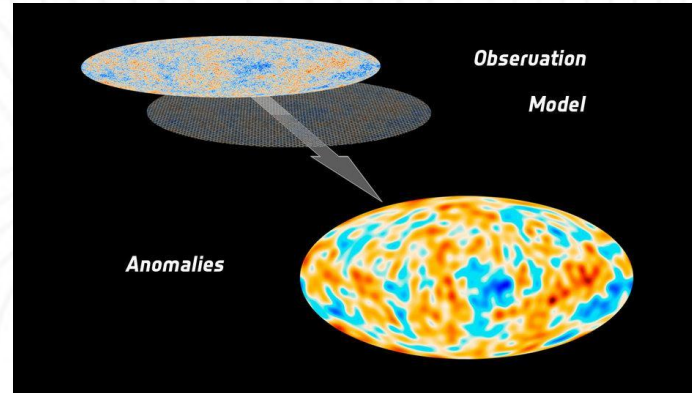


Who are we?

Relativity and Cosmology Group

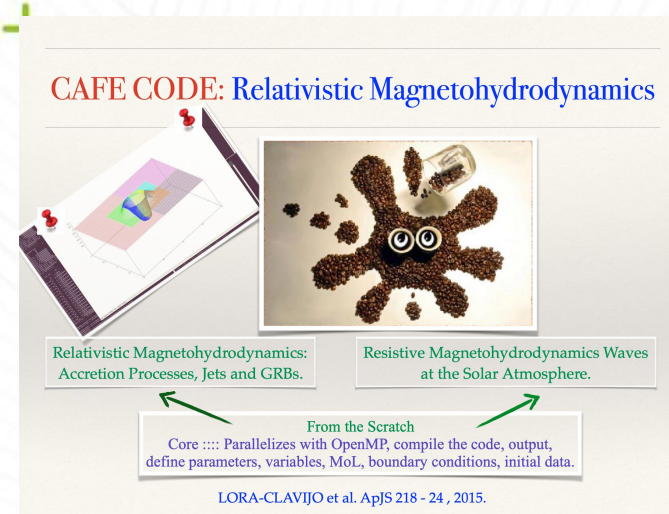
Lines of Research

- Cosmology,
- Relativistic Astrophysics
- High Energy Astrophysics
- Geophysics



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Multidisciplinary group

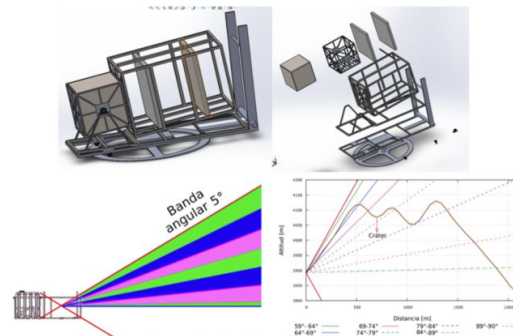
7 staff

4 postdocs

8 PhD students

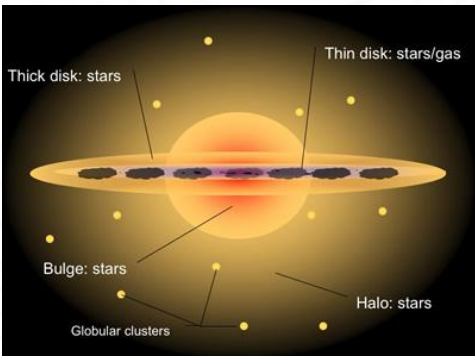
6 master's students

MuTe (Muon Telescope)
(30x30) pixels camera for high precision muon detection



Joint effort from UIS (Col), UT (Col), SGC(Col), CONIDA(Per) and UNAM(Mex)

Legado académico y cultural de los santandereanos



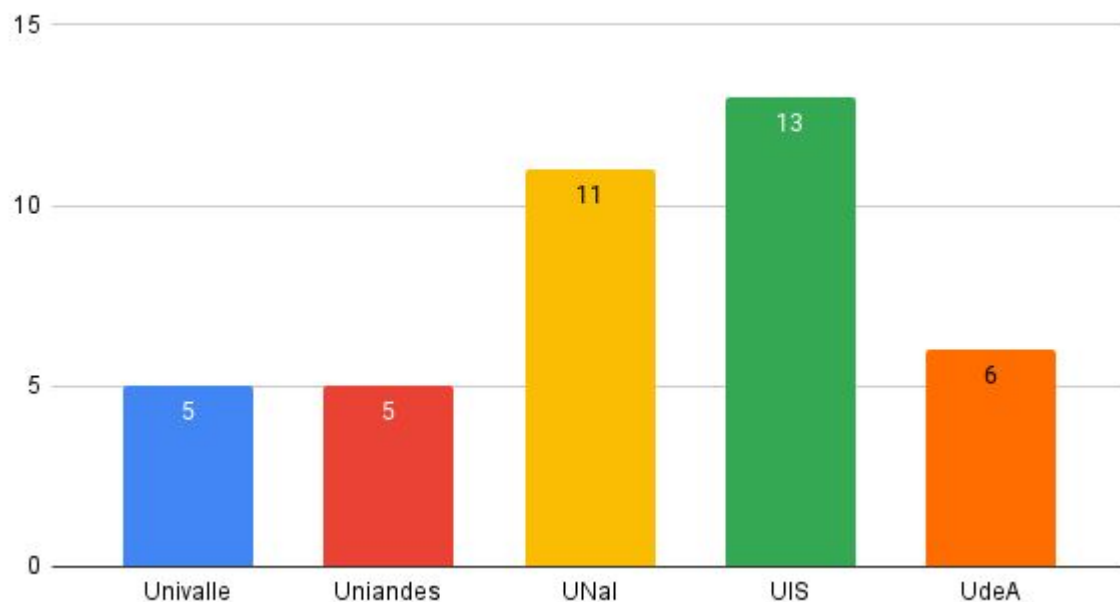
Active Cosmology and Astrophysics PhD program

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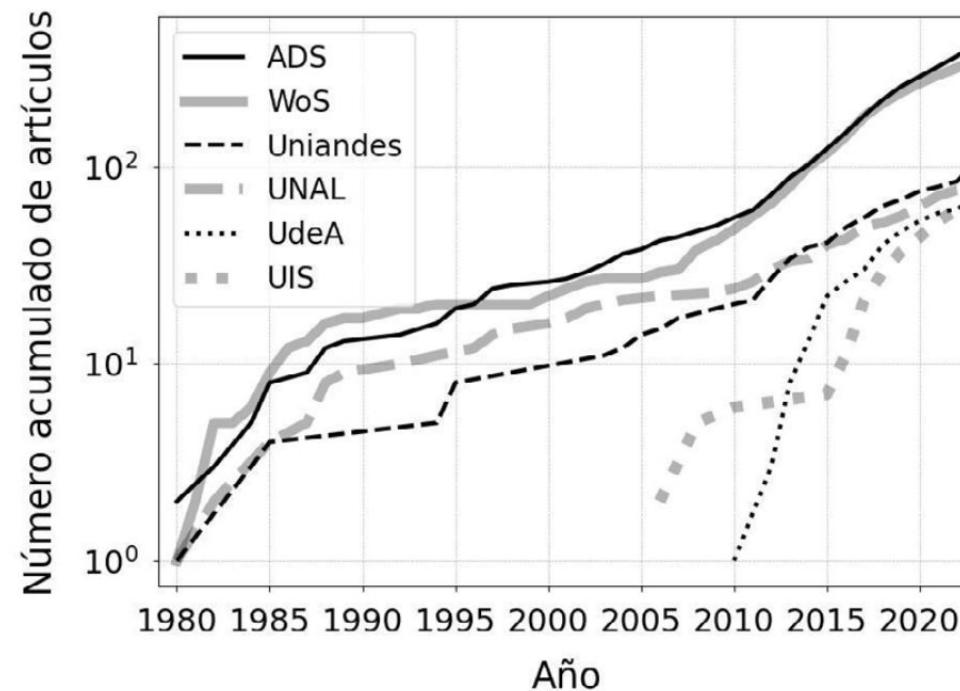
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Colombia Astronomy & Astrophysics Dissertations 2024-2020



Número de artículos



Guevara-Montoya, S., et al (2024). Astronomía en Colombia: una perspectiva bibliométrica. *Revista De La Academia Colombiana De Ciencias Exactas, Físicas Y Naturales*, 48(188), 638–657. <https://doi.org/10.18257/raccefyn.2589>

International collaborations



The LAGO Collaboration

LAGO is an Auger Observatory spinoff collaboration with 83 members from 25 institutions at 10 LA countries & Spain

Scientific goals:

- Astroparticles up to the Cosmic Ray knee
- Study transient and long term Space Weather phenomena through Solar modulation of Cosmic Rays
- Measurements of background radiation at ground level
- Applications of Cosmic Rays (Muography/Moisture)

Academic goals:

- *Train latin-american students in HEP and Astroparticle techniques*
- *Build a Latin-American network of Astroparticle researchers*



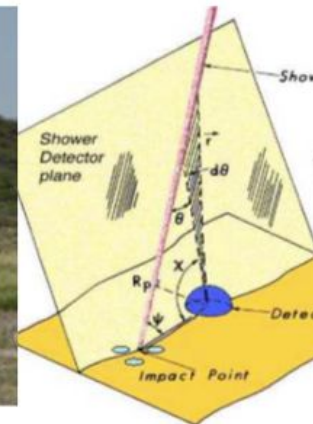
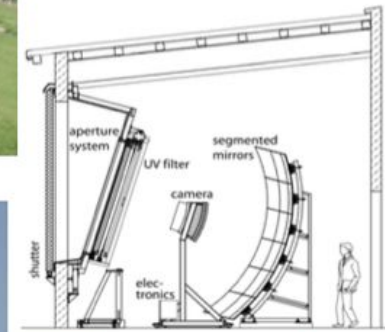
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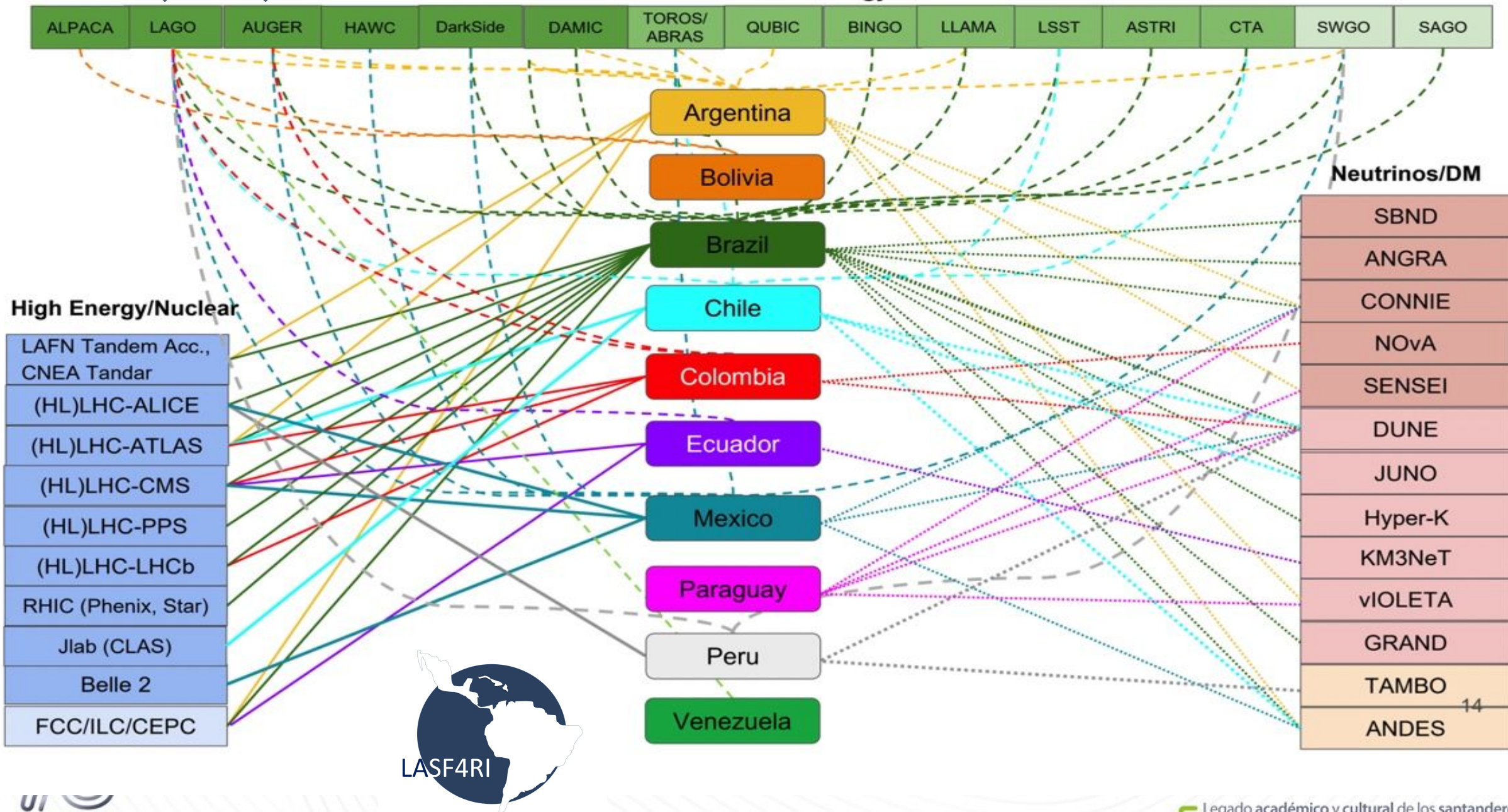


The Pierre Auger Observatory

Concept



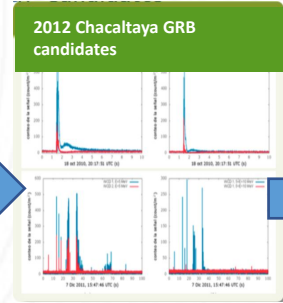
Legado académico y cultural de los santandereanos



2011 first WCD



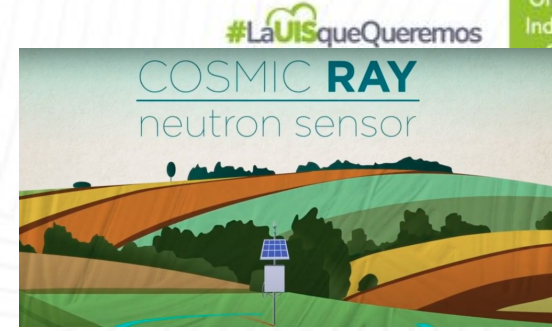
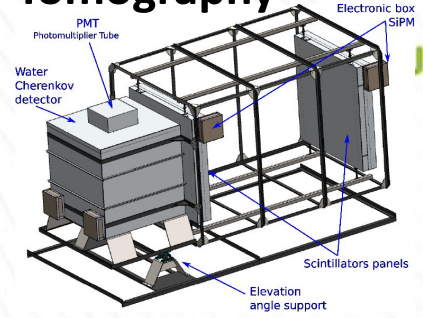
2012
Chacaltaya GRB
Analysis



2015
LAGO Space Weather
Auger Member

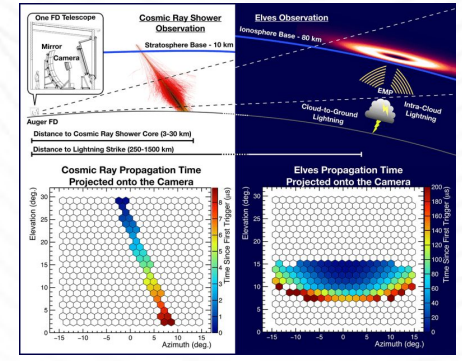


Volcano Muon
Tomography

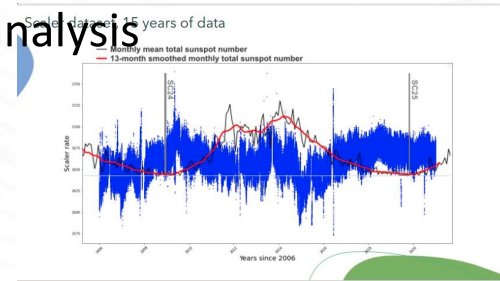


Precision agriculture with cosmic rays

ELVES & lighting analysis



Long/short term scaler
analysis



Auger and LAGO
Observatories
significant
influence in
Colombian
Astroparticle
Physics

Hernán Asorey



Roberto Mussa



CosmoGeophysics

Piera Ghia



Outreach



Xavier Bertou



Ronald Cintra Shellard

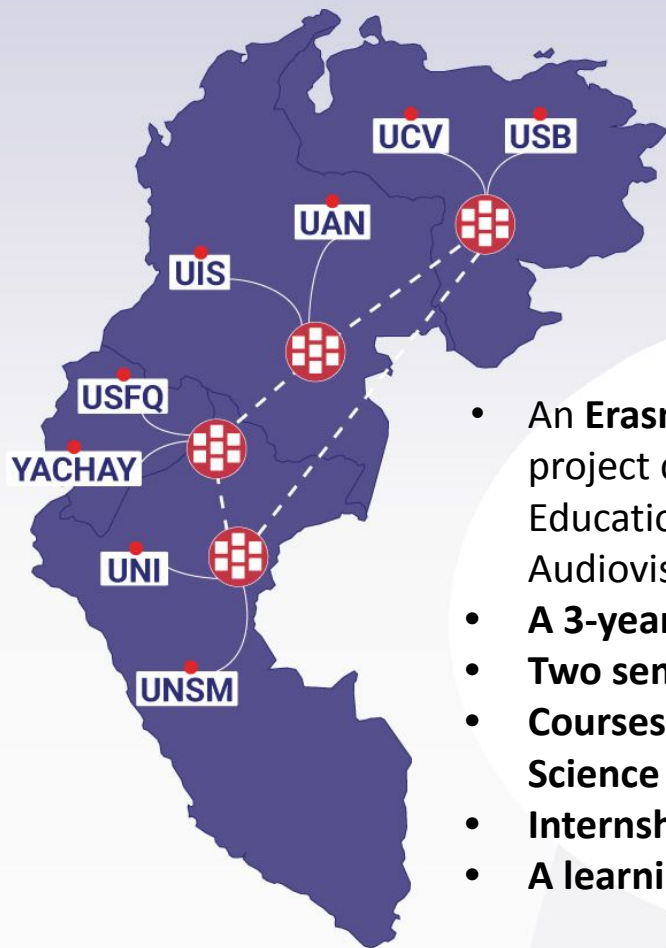




<https://laconga.redclara.net>

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- An Erasmus+CBHE (Capacity Building in Higher Education) project co-funded by the European Commission's Education, Audiovisual and Culture Executive Agency
- A 3-years project. Officially started in January 2020
- Two semesters corresponding to M2 EU Master
- Courses in Physics, Scientific Instrumentation and Data Science
- Internships in research labs and Industrial partners
- A learning community



11 universities from Latin America and Europe join efforts with other scientific (CERN, CNRS, DESY, ICTP, IRFU, RedCLARA) and industrial partners to contribute to the modernisation, accessibility and internationalisation of higher education in **Colombia**, **Ecuador**, **Perú** and **Venezuela**



LA-CoNGA physics presenta

CURSO INTERNACIONAL DE ASTROPARTÍCULAS Y COSMOLOGÍA

Rayos Cósmicos , Miguel Mostafa, <i>Universidad de Temple, Estados Unidos</i>	3, 5, 10, 12 Septiembre
Neutrinos de Altas Energías , Ignacio Taboada, <i>Instituto Tecnológico de Georgia, Estados Unidos</i>	17, 20 Septiembre
Rayos Gamma , Alberto Carramiñana, <i>Instituto Nacional de Astrofísica, Óptica y Electrónica, México</i>	24, 26 Septiembre
Cosmología , Clara Rojas, <i>Yachay Tech, Ecuador</i>	1, 3 Octubre
Agujeros negros primordiales y ondas gravitacionales cósmicas , Guillem Domènech, <i>Universidad Leibniz de Hannover, Alemania</i>	8, 10 Octubre
De los átomos a los agujeros negros , Javier A. García, <i>Instituto Tecnológico de California, Estados Unidos</i>	15, 17 Octubre

Horario: 10:30-12:30 CO PE EC // 11:30-13:30 VE

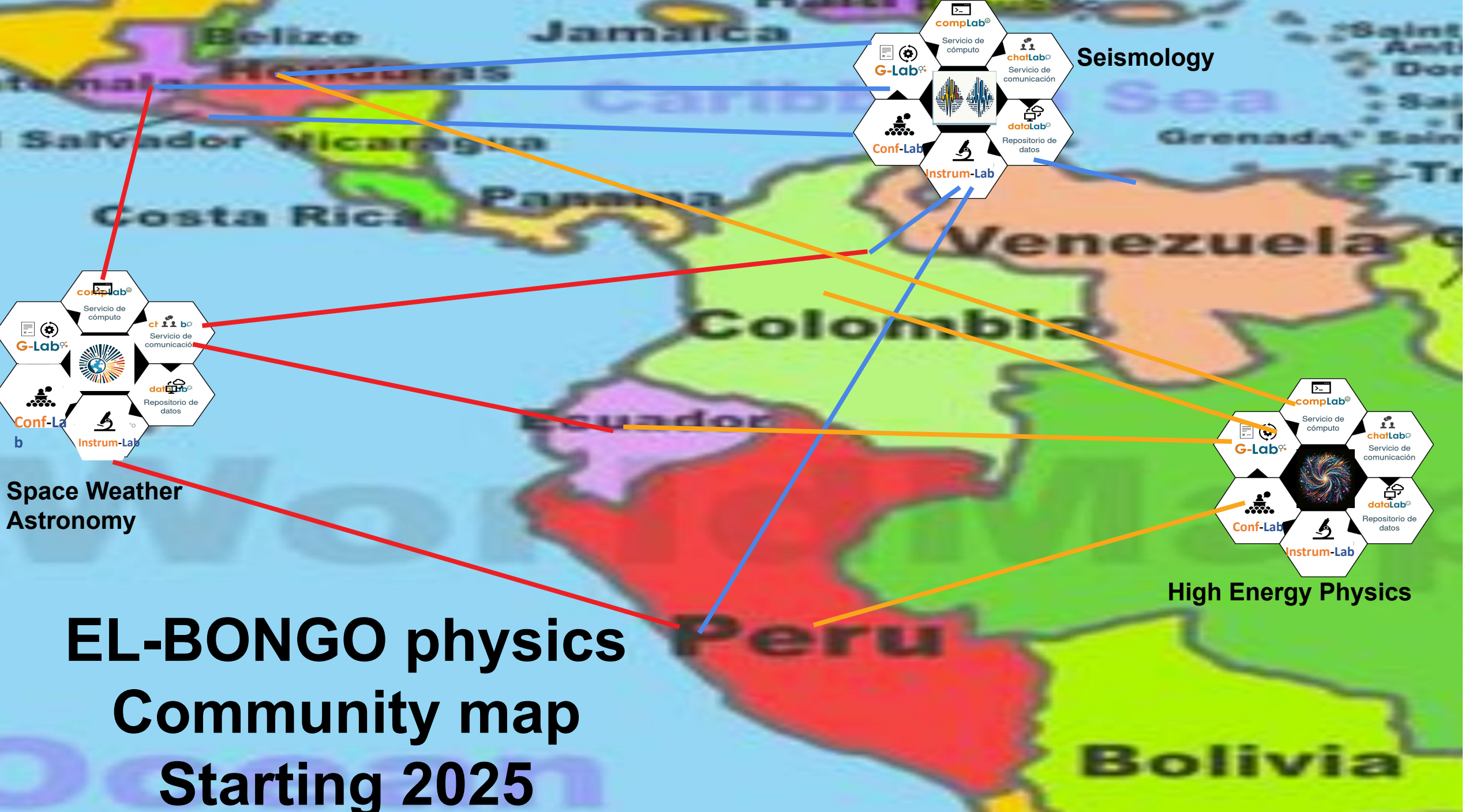
Inscripción: <https://jupyterhd.redclara.net/event/68/registrations/7/>

Latin American alliance for Capacity building in Advanced physics
LA-CoNGA physics

LAGO

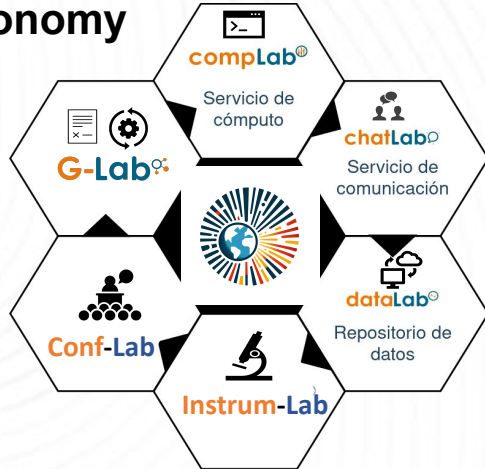
CYTED

PROGRAMA IBEROAMERICANO DE CIENCIA Y TECNOLOGÍA PARA EL DESARROLLO



EL-BONGO Physics: E-Latin america digital huB for Open Growing cOMmunities in physics

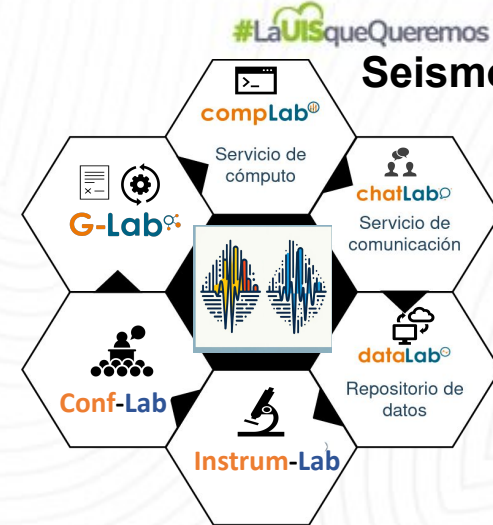
Space Weather Astronomy



- Courses
- Workshops
- Data
- Codes
- Publications
- Chats
- Visualizations



Seismology

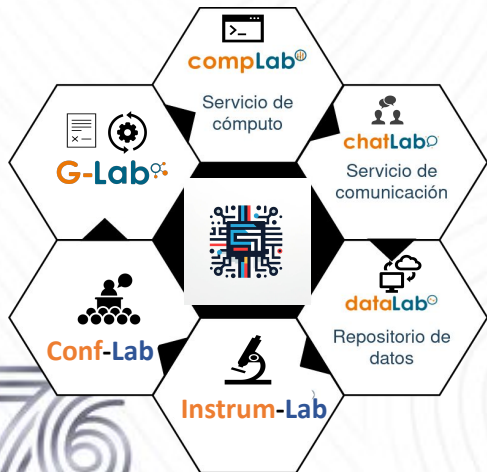


- Courses
- Workshops
- Data
- Codes
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- Chats
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Inter Community Open Science Hub

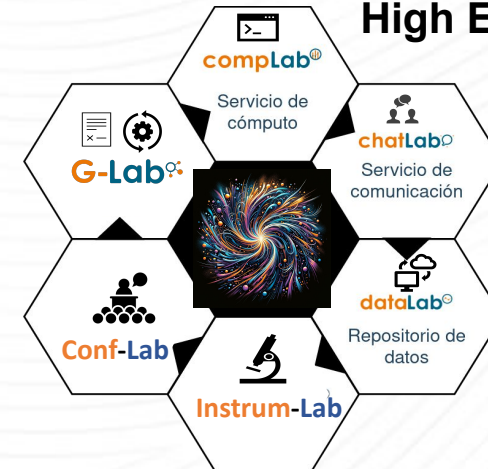
AI-HPC Tools



- Courses
- Workshops
- Data
- Codes
- Publications
- Chats
- Visualizations



High Energy Physics



- Courses
- Workshops
- Data
- Codes
- Publications
- Chats
- Visualizations

USa(ES), UIS, ULyon, UFG(SV), UNMSM(PE), UP(PA)

UNAH (HN), USC(GT), UPC(FR), UPS(FR), USFQ(EC), UNI(PE), UAN(CO)



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¡Gracias!

Thanks

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