Advanced Computing Research Ecosystem in LAC

From HPC SCALAC Observatory

SCALAC

Sistema de Computación Avanzada para América Latina y el Caribe

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SCALAC-UIS-INRIA

- **33 Independent Countries**
- **19 Overseas Territories**
  - 3 Autonomous Non Sovereign Countries (NL)
  - 3 Special Municipalities (NL)
  - 3 DOM (FR)
  - 2 Collectivities (FR)
  - 6 Overseas Lands (UK)
  - 1 Unicorporated Territory (Puerto Rico)
- **2 Autonomus Region**

530 Top Level Universities in the Region (QS 2026)

- 14 Top Universities in Computer Science (QS THE)
- 6 in Shanghai Ranking <100 (Brazil, Chile and Mexico)
- Strong collaboration with Europe: Spain, Portugal, France and Germany.
- 1,869 officially recognized higher-quality education institutions by European Union.
- ***33 SNCTI Systems*** + 300 High Impact Research Centers
- + 250000 High Level Researchers
- + 2000 Active Researchers (In HPC/HTC/AI/QC/Computing Continuum Subjects)
- + 30 in Advanced Computing (or related) Public and Private
- ***HPC/Advanced Computing Community joins SCALAC.***

https://scalac.redclara.net

Sources: CELAC and Ibero-American University Council (CUIB) and OCDE Documents (2025/09)

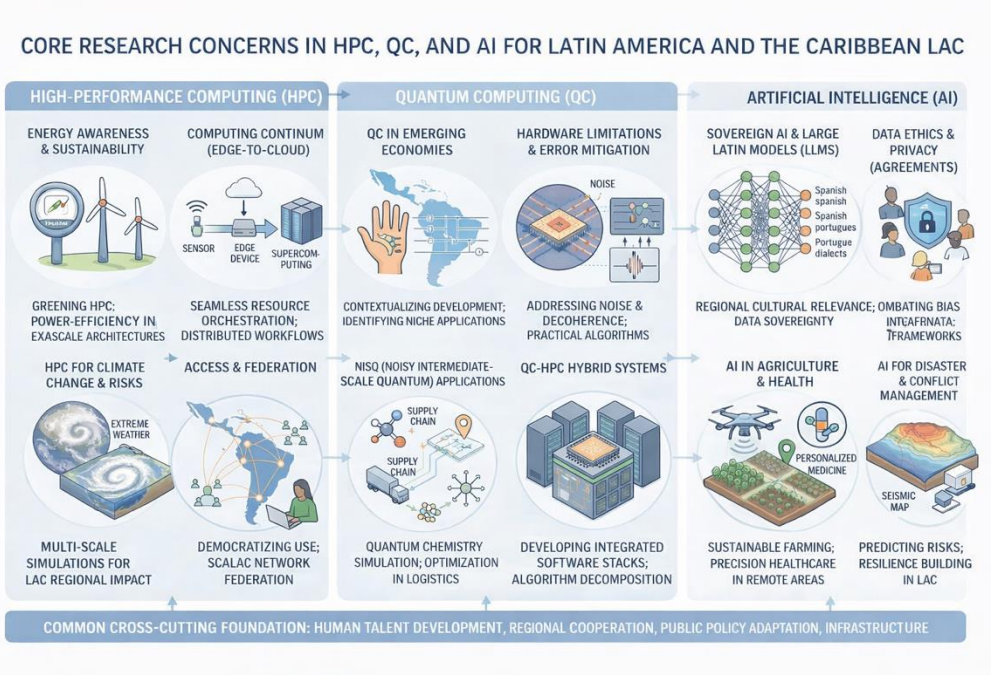
SCALAC: a Multi-Scale HPC Ecosystem

- As a Multi-scale HPC systems, SCALAC handles diverse workloads using advanced computing infrastructure for large data processing.
- This HPC ecosystem includes components that interact to create workflows and form a computing continuum.
    - People
    - Infrastructure
    - Applications
    - Knowledge
- Computing continuum activities manage massive workloads in data processing, transfer, and storage.

  Traditional Science Workloads

  AI Workloads

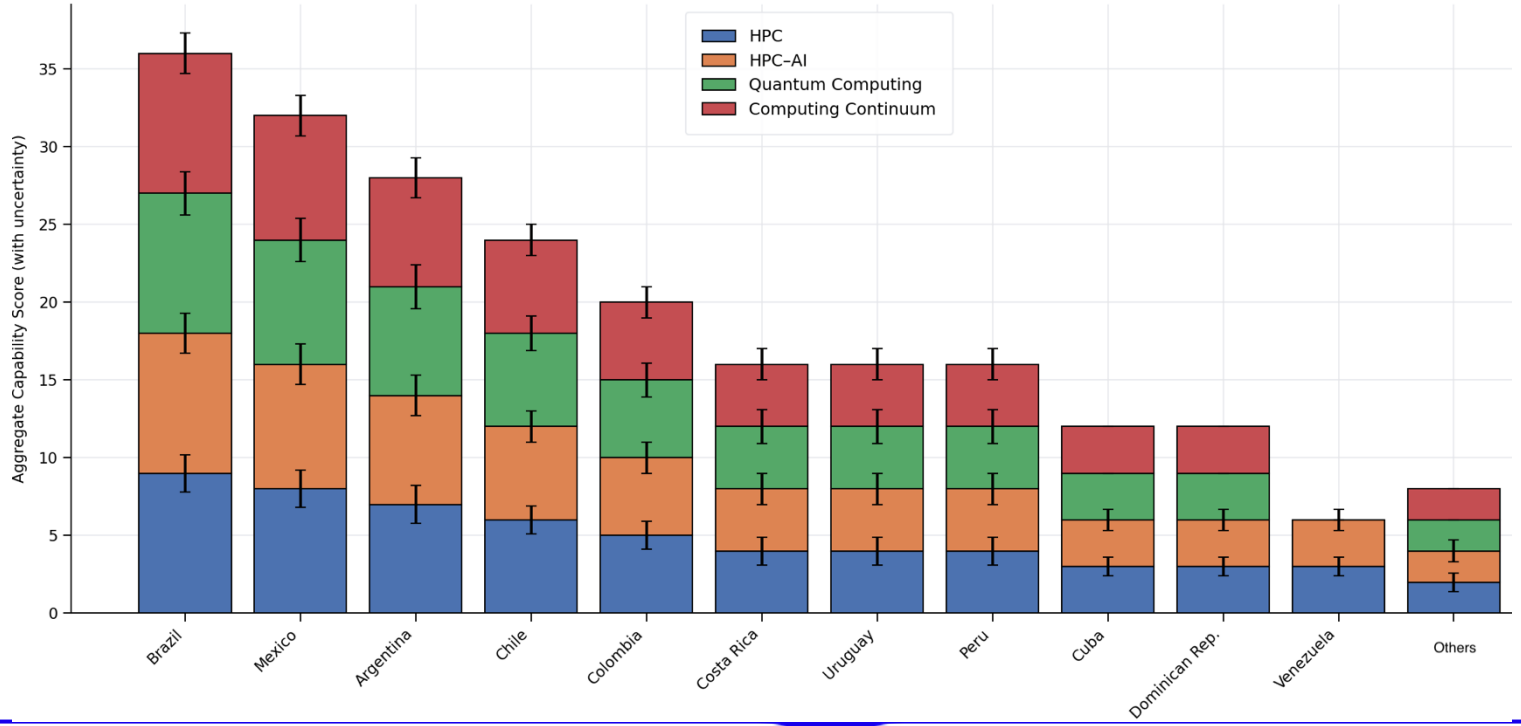
LAC Core Research and Hubs



- **Brazil** is the leading hub with major HPC centers and collaborations (via SCALAC). It hosts advanced HPC/AI projects and quantum computing initiatives.
- **Mexico**: Significant investment in HPC and AI, with strong academic and industrial participation.
- **Argentina and Chile:** Both nations are emerging leaders, with Chile hosting new AI HPC centers and Argentina contributing to HPC and computing research.
- **Colombia**: Active in HPC-AI and computing continuum research, with collaborations in advanced computing trends.
- **Other countries (Costa Rica, Peru, Uruguay, Venezuela, Domincan Republic, Jamaica, Panamá…):** « Smaller » but growing contributions, mainly through regional collaborations and applied HPC/AI Computing Continuum projects.

Sources: SCALAC HPC Observatory, anc CARLA Conference (Sept 2025)

LAC Publications (CARLA Conference Series)



Sources: SCALAC HPC Observatory (Sept 2025)

Some SCALAC Support for Uses Cases

- **Astronomy and Astrophysics**
- **LaConga/ElBongo Project**

- **Extreme Weather Events**
- Climate Exchange
- Volcanic Activity
- Amazonian Protection
- Oceanic Observation

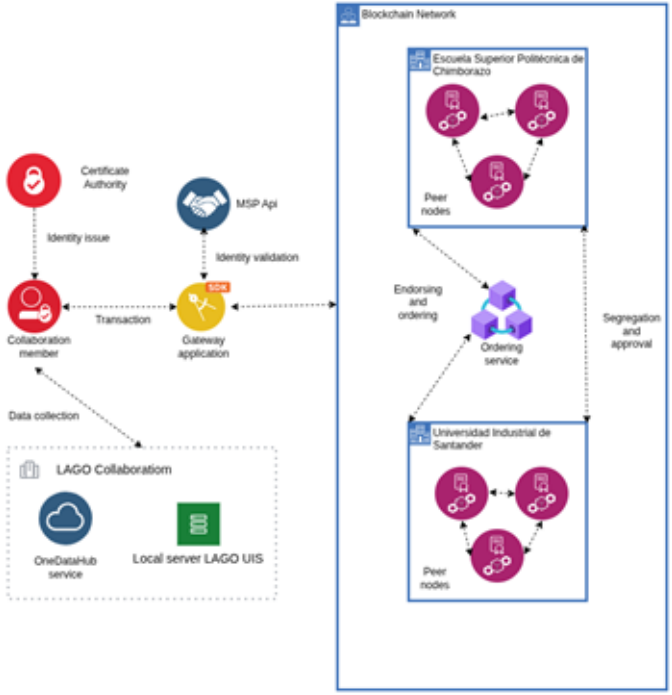
- **BioScience, Healthcare, and Scalable Analysis**
- HPC/ AI
- Data Analysis and Digital Twins
- Biomaterials

- **Smart Cities and Sustainability**
- Smart Territories
- Sustainable Information
- **Sustainable HPC Testbed Data Centers**
- Intercontinental Data Processing (BELLA-2 Project)

- **Mobile AI Vehicles**
- Agriculture uses
- Civil Infrastructure Monitoring and Attention
- Protection of Historical and Cultural Sovereignty

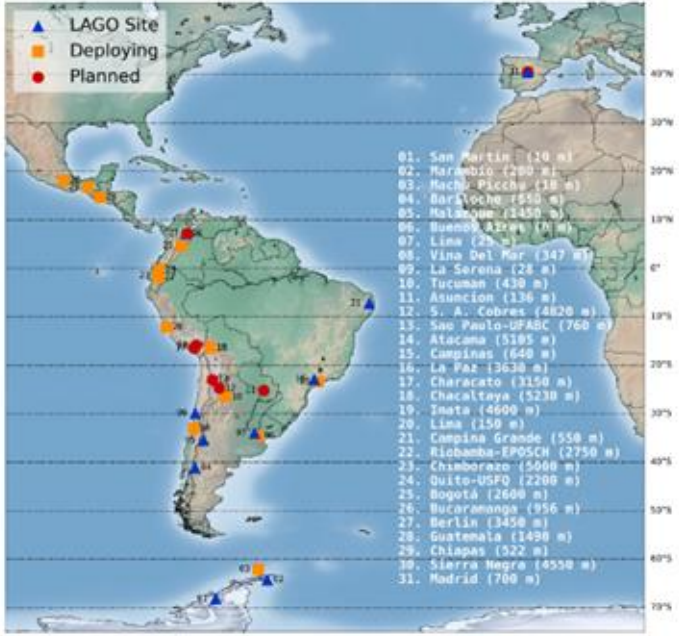
LaConga/ ElBongo Project :

https://elbongo.redclara.net



Full-scale prototype

Monitoring



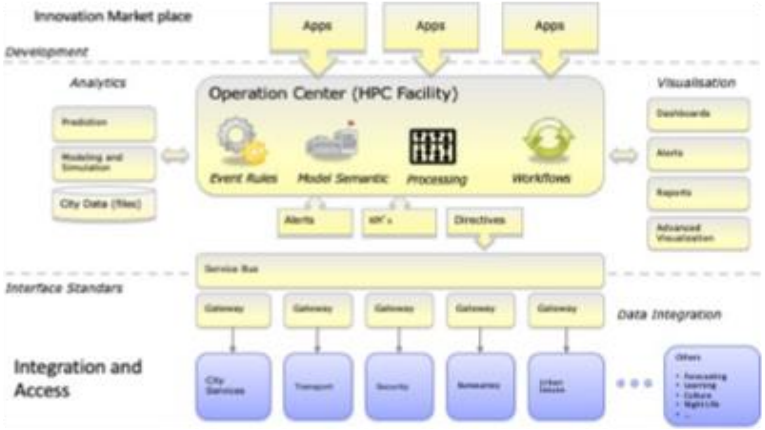
EL-BONGÓ physics

Co-funded by the European Union

SCALAC

CATAI Collaboration France-Colombia

SmartTerritories

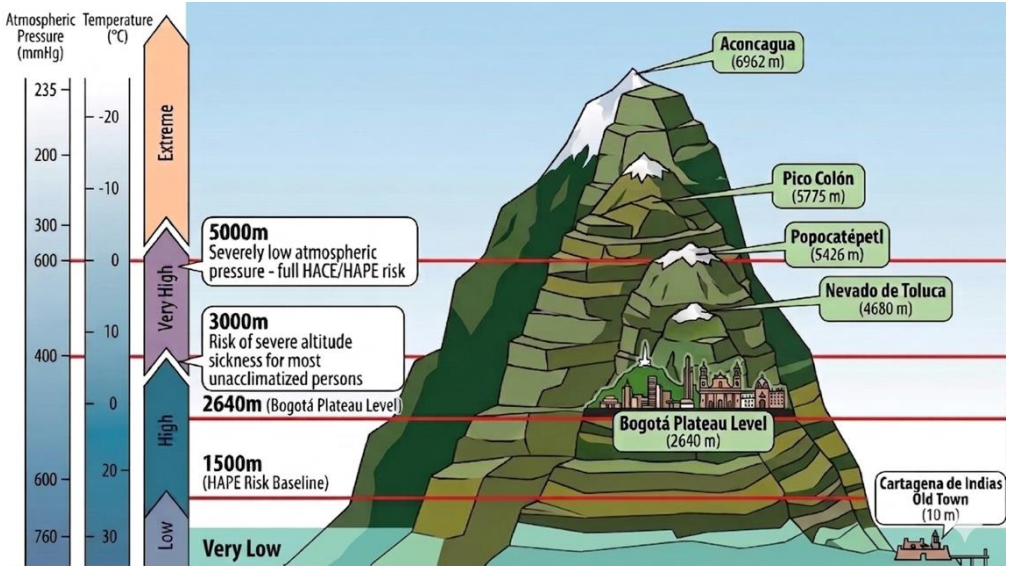


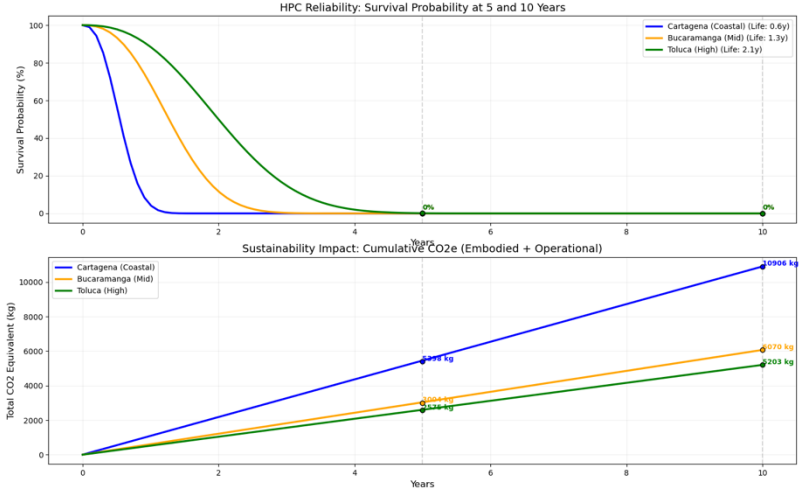
- Energy consumption and computing performance prediction
- Data hierarchy
- Cloud visibility model
  - In-Situ Cloud/HPC Support
- Data visualisation
- Link between nano-clouds

From www.catai.fr

CATAI
Collaboration France-Colombia

HPC Testbed Sustainable Data Centers





Simulation assesses altitude, usage, power stability, and corrosion to determine hardware lifespan, aiding sustainable upgrade and data HPC/AI center decisions.

sighpc computing continuum

https://sighpc-continuum.acm.org/

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