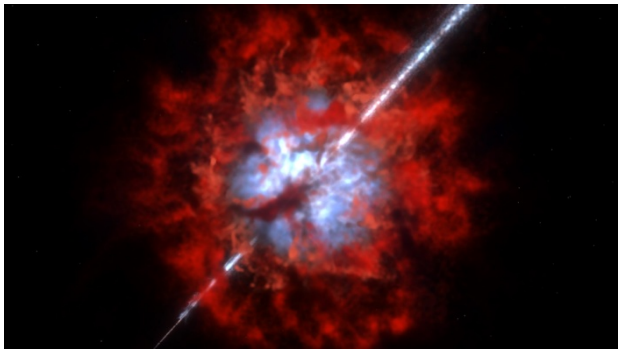
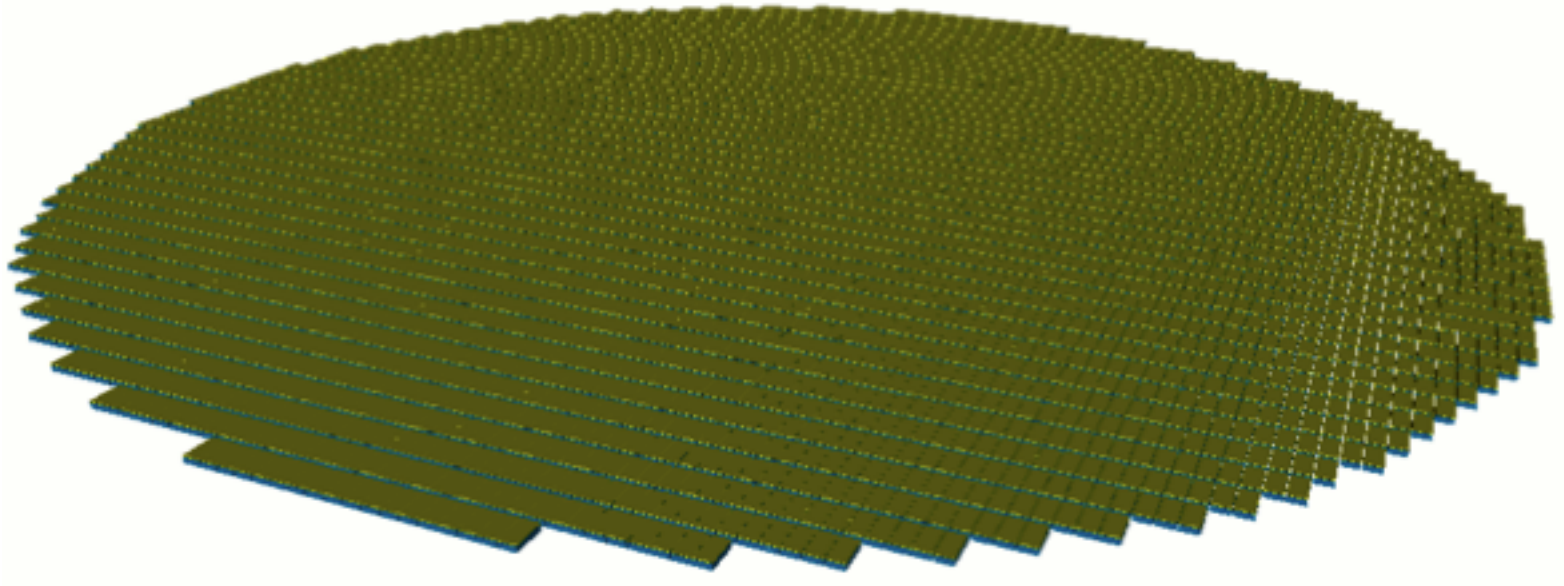
LATTES

Large Array Telescope for
Tracking Energetic Sources





LIP

TÉCNICO LISBOA

FCT Fundação para a Ciência e a Tecnologia
MINISTÉRIO DA EDUCAÇÃO E CIÊNCIA

REPÚBLICA PORTUGUESA

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www.lip.pt/experiments/lattes/

LATTES TEAM PUBLICATIONS PRESENTATIONS MEETINGS CONTACTS

Overview

Present and planned large field-of-view (FoV) gamma-ray observatories are installed in the Northern Hemisphere, missing in particular the galactic center and have energy thresholds above 0.5 TeV.

The goal of LATTES is to design, prototype and construct a ground array able to monitor the Southern gamma-ray sky above 50 GeV, bringing to ground the wide field-of-view and large duty cycle observations characteristic of satellites, with comparable sensitivity and a cost one order of magnitude lower. Such an instrument will be a powerful time-variance explorer covering a missing space in the global multi

Next LATTES meeting

6th LATTES meeting, 29-30 May 2018
Prague, Czech Republic

The goal of LATTES is to design, prototype and

Key Words

1- Towards a single collaboration - Heidelberg 8/10

2- Physics - white book or something similar

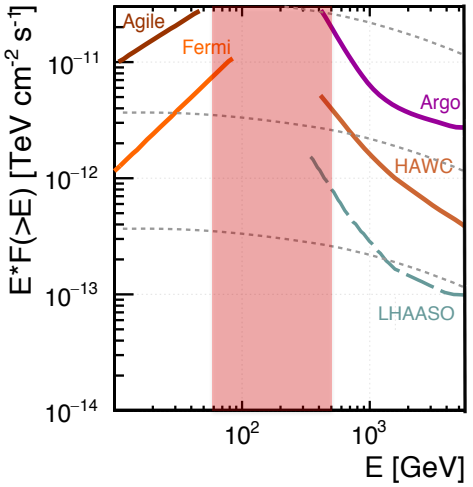
3- Detector and Performance - several detectors concepts

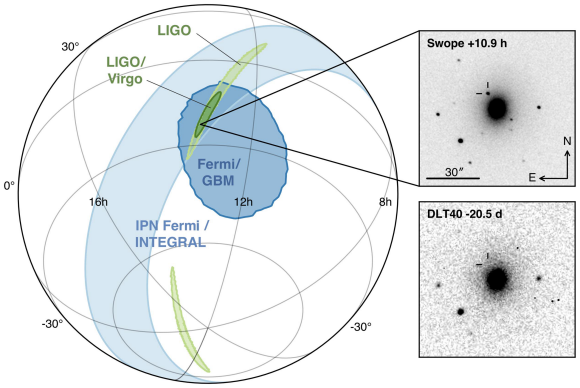
4- R&D - production and test of prototypes

5- Site - evaluation of sites (Chile, Argentina) and of the local support.

Wide field of view gamma-ray observatory in South America

- A broad energy range : From satellites to the highest energies (Core + sparse array at 5000 m a.s.l.)
- Complementarity to: CTA, IceCube, KM3NET, GW observatories (transients, sources variability, …)
- Build on the experience of successful observatories: Argo, HAWC, Auger, …
- Low maintenance / reasonable cost





Science

Gamma-ray physics

- Study of flares and transient sources.
- Identification and study of extended photon sources (Fermi bubbles, …)
- Assessment of the sensitivity of LATTES to indirect dark matter (DM) searches.

Cosmic-ray physics

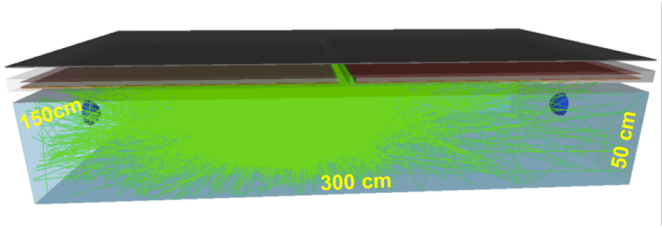
- Study the nature of cosmic rays up to the first "knee" energy region.
- Study charged cosmic rays and their connection with accelerator measurements.

Multi-Messenger (astro)physics

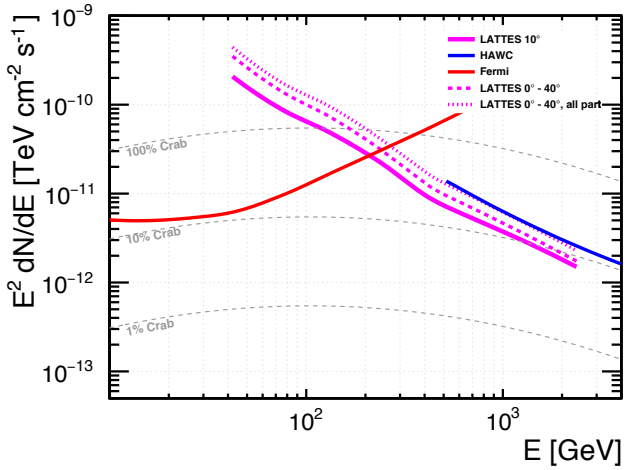
- Search for electromagnetic counterparts of extreme energy phenomena such as the Gravitational Waves and neutrino bursts.

Detector concept and performance

- An hybrid detector : 1ns time resolution (angular resolution), calorimetric energy measurement (trigger)



- Results from LATTES concept are quite encouraging! (end-to-end simulation)



(*Astropart.Phys. 99 (2018) 34-42*)

How to go ?

- Built an enlarged LATTES collaboration
- Establish links with CTA/HAWC/LHASSO
- Science opportunities (50 GeV - 100 TeV)
- Site procurement
- General design – baseline and alternatives
- Sparse array
- Simulations data sets
- Better reconstruction algorithms
- Better gamma/hadron algorithms
- Detector detailed design and prototypes
  - RPCs
  - WCDs
  - Trigger and data readout
  - Auxiliary systems: Power, gas, sensors and slow controls
  - Thermal simulation (freezing ?)
- Funding opportunities