

## 1. AMIGA PROJECT

AMIGA (Auger Muons and Infill for the Ground Array) is an extension of the Pierre Auger Observatory that allows the Observatory's energy detection range to be extended by more than an order of magnitude, reaching  $10^{17}$  eV.

## 2. OBJETIVE

Its scientific objective is to study the so-called "transition zone" between  $10^{17}$  and  $10^{19}$  eV, where the switch from galactic to extragalactic sources of cosmic rays is believed to occur.

This region represents an area of immense astrophysical interest, marking the beginning of the study of extragalactic sources that, at higher energies, would allow the emergence of a new astronomy: charged particle astronomy.

## 3. DETECTION

The detectors are composed of two sets of "infill" (a dense arrangement of detectors, within another more spaced one) of surface detectors (SD) with a distance between them of 750 m and 433 m, which work together with 234 buried detectors (UD) (Figures 1 and 2).

Underground detectors detect particles capable of passing through the ground to significant depths: muons. These detectors consist of three modules of  $10 \text{ m}^2$  each, located at a depth of 2.3 m and acting as particle counters.

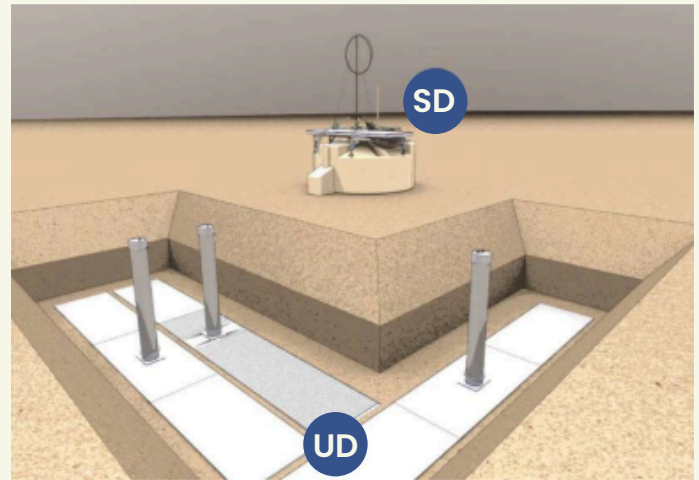


FIG 1. DISTRIBUTION AND LOCATION OF THE DETECTORS.



Each of the modules consists of 64 plastic scintillators, a solid-state multi-pixel light sensor and ultrafast data acquisition electronics. This configuration allows precise measurement of the muon component of particle showers, which reveals significant details about the mass of the primary particle that entered the atmosphere. In this way, AMIGA has the ability to quantify a fundamental feature for understanding the nature and origin of cosmic rays within the energy range of interest.

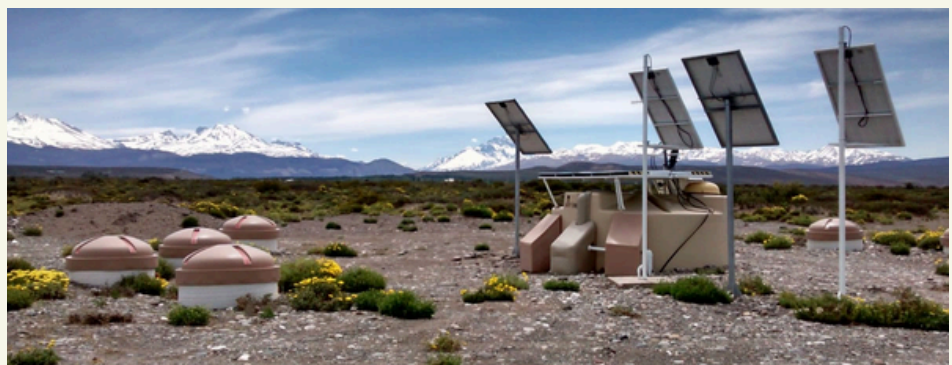


FIGURE 2. ACTUAL LOCATION OF THE DETECTORS