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THE PAS (POLO DE ASTRONOMIA SOCIAL) PROJECT

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The PAS Project has two main objectives: to build a World class centre in astroparticle physics and related sciences, and at the same time, to become a permanent link between Science and Society.

Due to its geographic characteristics, the Andean *Páramo* located near Berlín, Colombia (+7.13 N, −72.9 W, 3450 m a.s.l.), is an excellent location to build an array of particle detectors to study cosmic rays in a wide energy range, including solar activity modulation of cosmic rays, gamma astronomy, and the high energy region of the cosmic rays spectrum.

This facility will be operated by an interdisciplinary group of researchers closely related to the LAGO (*Large Aperture Gamma Ray Burst Observatory*) international collaboration.

The design of the detector array is based on Corsika air showers and Geant4-based detector response simulations, and deeply supported by the experiences of previous arrays of WCD, such as the Pierre Auger Observatory. The proposed design of this array will allow to implement two different measurement modes: the counting mode and the shower mode. In the counting mode, the variations in the recorded flux of secondary particles at detector level can be correlated with transient phenomena, such as the solar modulation of galactic cosmic rays or the arrival of the highest energy component of an energetic GRB, and even with long term flux modulations related for example with the solar activity cycle. In the shower mode, in contrast, we will look for time-space correlated signals in different detectors of the array. In this way, it will be possible to determine the main parameters that characterize the extensive air shower (EAS) produced by the interaction of a single high-energy cosmic ray with the atmosphere. The size of the array and the increasing spacing between detectors will allow to complement present measurements in the so called knee region of the cosmic ray energy spectrum ($E \sim 10^{15}$ eV) and beyond, as shown in Figure 1.

Our other objective will be reached by the installation of three buildings: one 12 m hemispherical dome, the so called "Society" dome, will harbor a digital Planetarium and Convention and Data Visualization Center with capacity for one hundred people; the second dome, the "Science" dome, will hosts labs and offices all the scientific activities and a 20 inches optical fully automatized telescope for outreach activities and astronomical research at the Paramos. A first sketch of the design of this facilities is shown in Figure 2. The third building is the one that completes our concept, where an interactive visualization wall and roof will reproduce different animations and simulations on different science topics: cosmology, astronomy and astrophysics, particle physics, planetary science, biology, genetics, and a very long etcetera. This is the "Science tunnel", which will be the place where a true link between science and society shall be established.

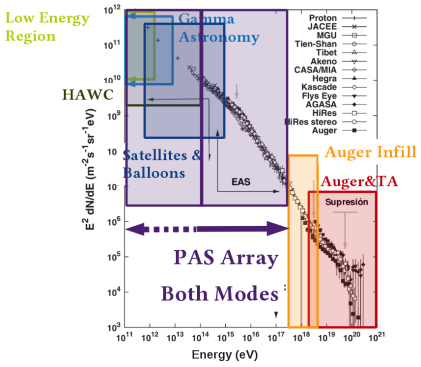

Fig. 1. The cosmic rays spectrum, multiplied by E^2 to emphasize the spectral features, as measured by different experiments and observatories.

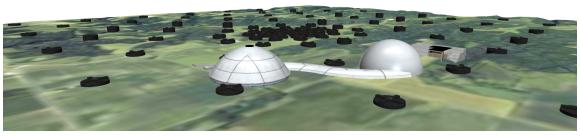

Fig. 2. The PAS project concept: the "Science dome", the "Society dome" and the "tunnel of Science" establishing a bridge, a link, between Science and Society.

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