

MILAGRO

Milagro is the first EAS detector with an all-sky, high duty-factor capability, to be sensitive to gamma rays in the TeV energy range. The core of the Milagro detector is a 80m x 60m x 8m covered pond filled with water and instrumented with 723 8" PMTs. The pond has been operational continuously since Jan. 2000 and records air showers at a rate of 1-2KHz. So far we have observed two TeV gamma-ray sources – the Crab Nebula and Mrk 421 during its flare of Winter 2000-2001. We have also demonstrated for the first time in a ground-based array successful gamma-hadron background rejection. In addition, Milagro continually monitors the northern skies for gamma-ray bursts (GRBs).

Currently we are completing the detector with an array of outrigger counters that will allow us to find the core position for showers which land off the pond. This will give us a substantial increase in sensitivity in both angular accuracy and background hadron rejection. In addition, Milagro will soon have a trigger processor capable of rejecting muon triggers thus allowing us to reduce our threshold substantially which will dramatically increase the volume of space over which we will be sensitive to GRBs.



Figure 1- Aerial view of the Milagro Pond

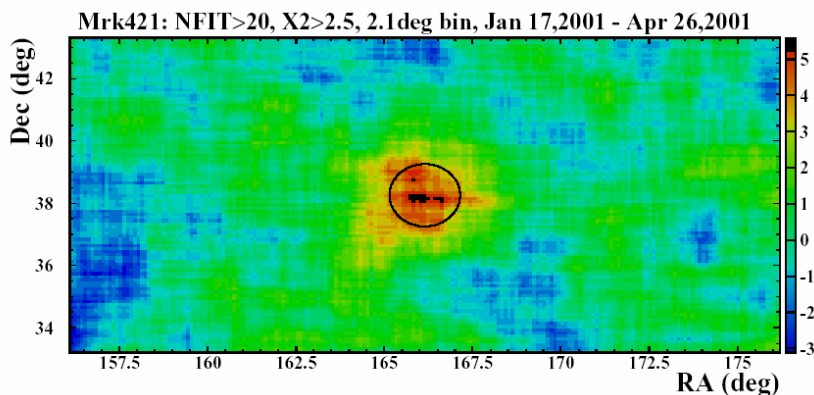


Figure 2 - Sky Map centered on MRK421 during the flare of winter 2000-01

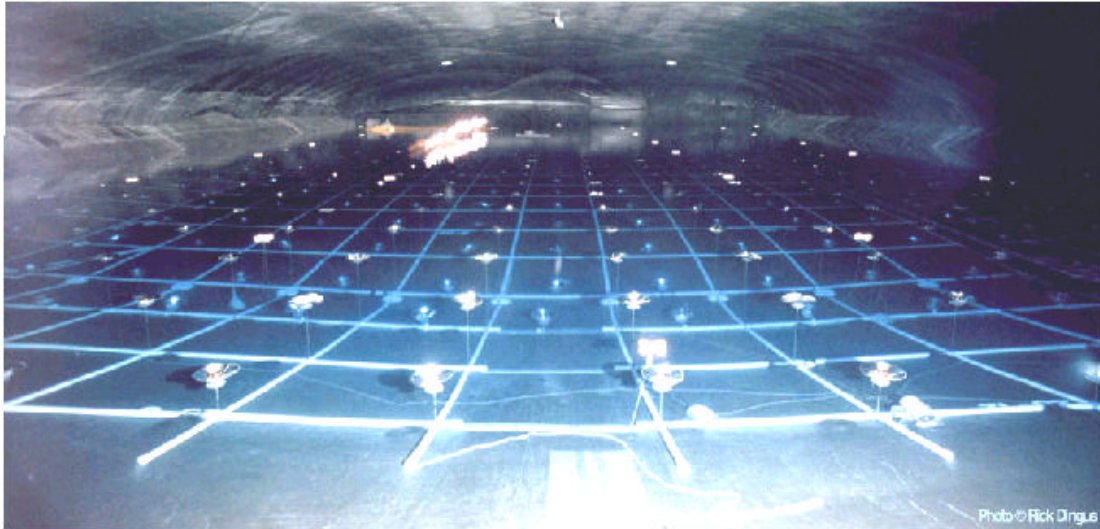


Figure 3 - Inside the water-filled Milagro detector. Two layers of PMTs can be seen.

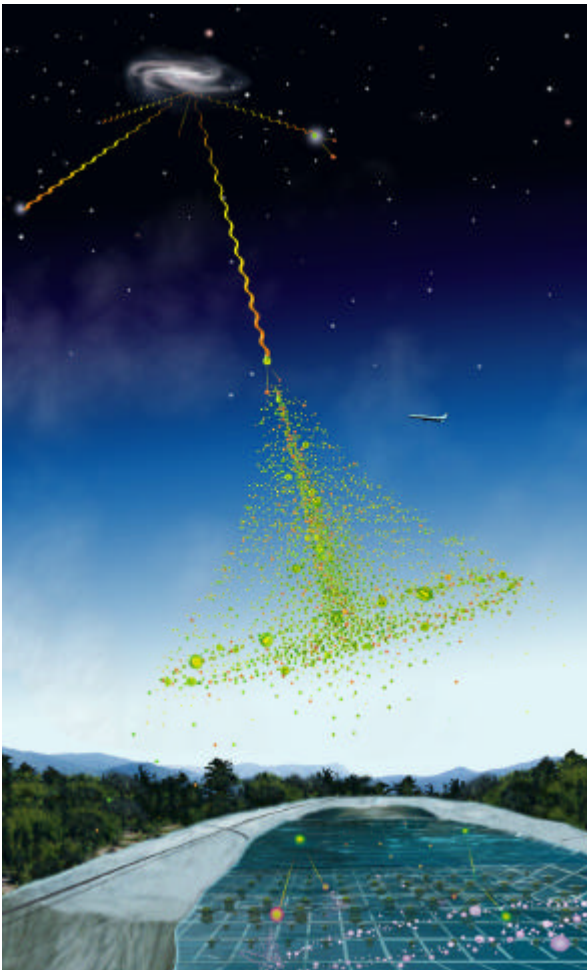


Figure 4 - Artist's depiction of an air shower hitting the Milagro Pond.



Figure 5 - Milagro outriggers