Astronomers using the VERITAS telescopes to detect some of the highest-energy photons in the Universe need your help! These photons are gamma-rays that originate in astrophysical environments like the expanding blast waves thrown out by supernova explosions, or from powerful streams of material that flow from the cores of active galaxies at speeds close to that of light. Muons (a particle like an electron, only heavier) are a prominent background contaminant when observing very-high-energy gamma rays on earth. They leave a distinctive ring-like shape making them obvious to the human eye, but incomplete or truncated rings can appear very gamma-ray-like to automatic analysis algorithms. We need your help to identify camera images that contain muon rings so we can teach computers to better identify such images and efficiently filter out those pesky muons that are masquerading as gamma rays.

Find out more at  Muon Hunters
VERITAS Video

Videos on youtube can be found here.

Media

Here are copies of the new (2011) signs posted outside the FLWO Visitors Center close to the T1 telescope (click on the figures for full-size versions):
Observing Gamma Rays

Miles overhead, very-high-energy gamma rays enter the atmosphere and collide with air molecules. These collisions produce a shower of secondary particle that moves towards the ground at nearly the speed of light. The VHEFR gamma-ray image of the Crab Nebula is made from these “air showers.” This pulsar-powered nebula light only a few billionths of a second.

The telescope in front of you is one of five in an array. Using these telescopes rather than just one enables the direction and energy of each gamma ray to be determined more accurately and to reject numerous charged particles that act like noise in the observation.

Each telescope views the air shower from a different perspective and the resulting images have different orientations. The position is then the sky of a gamma-ray source can be determined from the intersection of lines drawn through each image.

The Crab Nebula is a supernova remnant produced by a single explosion seen in 1054 AD. This event was a single, supernova-class explosion of a massive star resulting in the formation of a neutron star and the supernova remnant generates gamma rays. The Crab Nebula, a source of gamma rays on Earth, emits a pulsar, which is used to calibrate the VERITAS instruments.

VHEFR derives precise measurements from gamma rays by detecting gamma-ray cascades that are produced in the atmosphere. These cascades are produced when gamma rays are detected by the VERITAS telescopes.

Gamma-ray astronomy has opened a new window on the universe. Thanks to gamma-ray telescopes, such as VERITAS, scientists can study things of high-energy invisible light produced in the most extreme environments in the Universe. These objects, such as black holes, supermassive black holes, and neutron stars, are not visible to the human eye.

Gamma Ray Astronomy
If you have any questions on astronomy or astrophysics in general please follow one of these links

- NASA - Ask an astrophysicist
- Ask an astrophysicist - specialising in cosmic-ray, gamma-ray and X-ray astrophysics
- Ask an astronomer
- McDonald's Observatory ask an astronomer
- Curious about astronomy ask an astronomer
- Cool cosmos ask an astronomer
- Ask an astronomer @ UCBerkely
- Lick Observatory ask an astronomer
- NRAO ask an astronomer
- Harvard CfA resources for amateur astronomers
- Phil Plait's Bad Astronomy page