

VERITAS (Very Energetic Radiation Imaging Telescope Array System) is a major ground-based gamma-ray observatory located at the basecamp of the Fred Lawrence Whipple Observatory in southern Arizona, designed to observe and study very-high-energy (VHE) gamma-rays (energies above ~100 GeV).

Because it is very difficult to produce gamma-rays, the objects that emit them are very interesting to astrophysicists. High-energy gamma rays are associated with exploding stars (supernovae), pulsars, quasars, and black holes rather than with ordinary stars or galaxies.

The emission of high-energy gamma-rays from cosmic objects always implies the presence of exotic and extreme physical conditions - high magnetic and electric fields, shock waves, cataclysmic explosions, etc. In fact, this emission offers the only direct probe of the extreme conditions in these exciting phenomena.

Electromagnetic radiation that does not penetrate the Earth's atmosphere, like gamma-rays and X rays, is usually studied by telescopes carried above the atmosphere in satellites. As a result, these detectors are limited in size and very costly. Moreover, the flux of very high energy (VHE) gamma-rays (energies above ~ 100 GeV) is so small that even the largest space-based gamma-ray telescopes cannot see enough photons to detect the actual sources of this radiation.

Fortunately, some 50 years ago, physicists in the United Kingdom (UK) discovered that very-high-energy gamma-rays (and cosmic rays) can be detected from the ground via the secondary radiation they produce when they strike the atmosphere. The secondary radiation is produced as a brief flash of blue light named after the Russian physicist, Pavel Cherenkov. The light is extremely faint and can only be detected at a dark site under clear skies. Although this flash only lasts for a few billionths of a second, it can be detected with large optical light collectors equipped with photomultiplier tubes.

The study of cosmic gamma-rays is now a major part of astronomical research. Like all

astronomy, this is basic research that probes the Universe for our greater understanding. It has no military objectives and no military support. All results from these studies are published in the international scientific literature and shared with colleagues at home and abroad. None of this work is classified.

Use the menu on the right to find an introduction to the science of VHE gamma rays, a short description of each of our papers (under "VERITAS Results") and a complete listing of our publications ("VERITAS Publications").