Cosmic Ray

Cosmic rays are bits of matter: protons, electrons, and atomic nuclei which have been stripped of their electrons. Although supernovae, gigantic exploding stars, have long been suspected as the source of most rays, the origin of the highest-energy rays has been more difficult to tie down.

Cloud Chamber

Visualizing Elementary Particles in Your World

Cloud chamber, invented by C.T.R. Wilson (c.1900), is used to detect elementary particles. The device below consists of a closed container filled with a supersaturated vapor (e.g., alcohol in air), where a large temperature difference is maintained between the top and bottom of the chamber, by cooling the bottom of the chamber with dry ice. When a particle (e.g., cosmic-ray muon, $\mu^-$) passes through the vapor, it leaves a trail of charged particles (ions) that serve as condensation centers for the vapor, which condenses around them. The path of the particle is thus indicated by tracks of tiny liquid droplets in the vapor.
Galileo’s experiment with a feather and a coin

Imagine you drop a light feather and a heavy coin from the top of the Leaning Tower of Pisa (150 ft. Will they reach the ground at the same time?

384-322 B.C. Aristotle says: “No! The coin will land first because heavier objects fall faster than the lighter ones, in direct proportion to weight.”

1590 years later Galileo says: “Yes! A coin and a feather will land together if there is no air resistance!”

A legend says that Galileo dropped cannonballs of unequal weights from the Leaning Tower of Pisa to show that both objects reach ground at the same time. This story is probably untrue. In fact, Galileo experimented with balls rolling down a ramp.

Galileo experimentally proved that objects fall with the same acceleration independently of their masses. He found a mathematical formula describing this motion: the distance traveled by a falling body is increased as the square of the time that has passed.

See for yourself that Galileo was right!!

Use our vacuum tube to prove that feather and coin fall at the same acceleration.

Galileo’s notes

Astronaut David Scott (Apollo 15 commander) watched as a geological hammer, released from his right hand, and a feather, released from left hand, reached the lunar surface simultaneously.

Acceleration of gravity on Earth: \( g = 9.8 \text{ m/s}^2 \)

Acceleration of gravity on the Moon: \( 1.6 \text{ m/s}^2 \)

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GENESIS 28:12 "AND HE DREAMED A DREAM, AND BEHOLD A LADDER SET UP ON THE EARTH, AND THE TOP OF IT REACHED TO HEAVEN, AND BEHOLD THE ANGELS OF GOD ASCENDING AND DESCENDING UPON IT."

PRESS THE BLUE BUTTON FOR

THE SPARK OF AGGIELAND

HIGH VOLTAGE IONIZES THE AIR BETWEEN THE CLOSEST POINTS ON THE BLADES

THE PASSAGE OF CHARGED PARTICLES HEATS THE IONIZED AIR

HOT AIR RISES CARRYING THE ARC WITH IT

TOO LARGE A SEPARATION ENDS THE IONIZATION
SCREAMING RODS

As gravity pulls down on the rotating disk between the disk and the rod, it causes the rod to spiral down. This spiraling motion causes it to pick up rotational energy. Thus, gravitational energy is converted into rotational energy.

WALKING RINGS

As gravity pulls down on the rotating disk between the disk and the rod, it causes the rod to spiral down. This spiraling motion causes it to pick up rotational energy. Thus, gravitational energy is converted into rotational energy.
As gravity pulls down on the rotating disk, the friction between the disk and the rod causes it to spiral down the rod. This spiraling motion causes it to pick up speed as if it were rolling down a ramp. Thus, gravitational energy is converted to rotational energy.
VOXET GENERATOR
(aka SMOKE RING CANNON)

This device generates a disturbance that exhibits circular vortex motion - a vortex tube. The disturbance can travel a long distance at constant velocity without a significant change in shape. This is an example of a special type of non-elastic wave known as a soliton.

Definition (electrophysics.com):
Soliton - A spatial or temporal wave packet that can be propagated as a solitary wave in nonlinear systems, and is soliton provided that it does not obey the superposition principle and does not dispense. “Soliton waves can be used to model waves with little loss of energy or amplitude.”

Solitons, solutions to the “soliton equation,” are found in many fields of science including classical fluids (water and liquids), quantum fluids (turbulent), and supercritical systems, and the theory of elementary particles. Some believe that “fast light” in a soliton.