



Cosmic Rays

What Are Cosmic Rays?

Cosmic rays are invisible, high-energy particles that constantly bombard Earth from all directions. Most cosmic rays are protons moving at extremely high speeds, but they can be atomic nuclei of any known element. They enter Earth's atmosphere at velocities of 90 percent the speed of light or more.

Meteors And Meteorites

What Is A Meteorite?

A meteorite is a large particle from outer space that lands on Earth. They range in size from a grain of sand on up. About 30,000 meteorites have been recovered in recorded history; about 600 of them are made primarily of metal, and the rest are made primarily of rock.

What Is A Meteor?

A meteor is a particle from outer space that enters Earth's atmosphere, but does not land on Earth. Instead, the particle burns up in the atmosphere, leaving a short lived, glowing trail that traces part of its path through the sky. Like meteorites, meteors can range from the size of a grain of sand on up; most of the time, though, a meteor larger than about the size of a baseball will reach Earth, in which case we call it a meteorite.

Where Do Meteors And Meteorites Come From?

Most meteors, especially those that fall during meteor showers, are the tiny remnants of comets left in Earth's orbital path over many, many years. Most meteorites, which are generally larger than meteors, are pieces of asteroids and comets that somehow came apart from their parent bodies—perhaps from a collision with another body—and orbited in the solar system until they collided with Earth.

The Moon

What Is The Moon?

The Moon is Earth's only natural satellite. It is 3,476 kilometres across, which is a little more than one quarter of Earth's diameter, or about the distance from Perth, Western Australia to Sydney, New South Wales. The Moon orbits Earth once every 27.3 days.

How Much Would I Weigh On The Moon?

The gravitational acceleration at the surface of the Moon is about one-sixth that of Earth. So if you weigh 68Kg on Earth, you would weigh just 11Kg on the Moon. Your mass, on the other hand, would remain unchanged whether you were on Earth or on the Moon. The Moon has no atmosphere and no liquid water at its surface, so it has no wind or weather at all. On the lunar surface, there is no protection from the Sun's rays, and no ability to retain heat like the greenhouse effect on Earth. Temperatures on the moon range from about 123 degrees Celsius to -233 degrees Celsius. The Moon's surface is covered with rocks, mountains, craters, and vast low plains called maria ("seas").

What Is The Moon Made Of?

Though the full Moon sometimes looks very much like a wheel of blue or Stilton cheese, it is actually covered with rocks, boulders, craters, and a layer of charcoal colored soil. The charcoal colored soil consists primarily of pulverized rocky and glassy fragments, and is up to several metres deep. Two main types of rock have been found on the moon: basalt, which is hardened lava, and breccia, which is soil and rock fragments that have melted together. Elements found in moon rocks include aluminum, calcium, iron, magnesium, titanium, potassium, and phosphorus.

Unlike iron-rich Earth, the Moon appears not to have much metallic content.

How Far Away Is The Moon?

On average, the Moon is about 384,000 kilometres away from Earth. This value was measured quite accurately by the ancient Greek astronomer Hipparchus, who lived in the second century B.C.E. Today, laser rangefinders have been used to measure a very precise value.



How Was Our Moon Formed?

The formation of the Moon was a great scientific mystery for many years. It was once thought that Earth and the Moon might have formed simultaneously as two separate objects, bound together by their mutual gravitational pull. This was shown to be unlikely after scientists proved that the two objects have very different compositions. Another idea suggested that Earth's Moon formed elsewhere, and was later captured into Earth's orbit as it went by Earth's gravitational influence. The major problem with this scenario is that Earth and the Moon are relatively close in size; gravitational capture is very, very unlikely, unless one object is many times larger than the other. Within the past few decades, scientists have shown that the most likely scenario of how the Moon formed involves the collision of two planetary bodies. Billions of years ago, before life formed on Earth, a Mars-sized protoplanet slammed into Earth at an angle. Most of the material in the protoplanet fell into, and became part of, our planet; some material, however, was thrown out into space, and began to orbit Earth as a ring of dust and rock. Within weeks, a large portion of that ring of material coalesced to form the core of our Moon; over millions of years, the Moon settled into its present-day size and shape.

What Is A Blue Moon?

A Blue Moon is the common term given to the second full moon in a calendar month. There is no astronomical significance to a Blue Moon, but it is a fun coincidence to notice.

Telescope Basics

What Is A Telescope?

Generally speaking, a telescope is an instrument that gathers light from distant sources in such a way that an image can be produced. The first telescopes were made with glass lenses attached to handheld cylinders or tubes. Today, telescopes are made in many different ways, and used together with all manner of scientific instruments, to study the universe near and far.

Who Invented The Telescope?

It is thought that, in the early 1600s, a Dutch optician named Hans Lippershey (c. 1570–c. 1619) built the first telescope. Many people, however, were converging on this new technology around that time. By 1609, Galileo Galilei (1564–1642) had built at least two telescopes, which he put to use in his study of the universe.

What Kinds Of Measurements Do Astronomers Make With Telescopes?

Astronomers take lots of carefully planned pictures with telescopes, using a wide variety of telescopes and detectors. These images can then be used to conduct a wide variety of measurements. Aside from examining the images themselves and looking at the shapes and sizes of objects in the universe, some of the most common types of more sophisticated analytical methods include astrometry, photometry, spectroscopy, and interferometry.

What Are The Two Main Kinds Of Telescopes?

There are two main types of telescopes: a refractor, which uses lenses to collect light, and a reflector, which uses mirrors. The first telescopes were refractors. Today, almost all of the telescopes being built are reflectors. This is mainly because large lenses require so much glass that they would quickly sag out of shape from their great weight.

What Is A Schmidt Telescope?

Invented by the German optician Bernhard Schmidt (1879–1935), this kind of telescope has a primary mirror as its main light-gathering component. This mirror is specially shaped so it can look at a very wide area of the sky at once. Like a "fisheye" lens on a camera, however, the resulting image is distorted. Thus, a special, thin lens is placed in front of the mirror, which corrects the distortion. This Schmidt design, which uses both refraction and reflection of light, is ideal for obtaining wide-angle images of the sky. It is often used in astronomical cameras.

What Is The World's Largest Schmidt Telescope, And What Has It Been Used For!

The largest Schmidt telescope, the 48-inch (122-centimetre) diameter Oschin Telescope, is at Palomar Observatory on Mount Palomar, California. It was used between the years 1952 and 1959 to conduct the Palomar Optical Sky Survey, the first major systematic photographic survey of the entire northern (and part of the southern) sky. Since then, the survey has been updated using digital camera technology. The telescope has also been used to search for distant Kuiper Belt and Oort Cloud objects. The Oschin Telescope was used to discover many of the largest known Kuiper Belt Objects, such as Varuna, Quaoar, and Eris (which is even larger than Pluto), and also Sedna, thought to be the first Oort Cloud object ever discovered.