



LEARN - What is the Difference Between Asteroids, Meteoroids, Meteors, Fireballs, and Meteorites?

Learning Objective:

Learn the difference between asteroids, meteorites, meteoroids, meteors, and fireballs.

Overview:

Many people wonder what the difference is between asteroids, meteorites, meteoroids, meteors, and other frequently used terms. They might seem similar but in reality have very different meanings. Some of them designate objects and others the visible luminous phenomena. The correct definition depends on the space rock's size, brightness and way of interacting with the Earth.

Specifics:

In the media, we often see the incorrect use of terms to designate small bodies in space and the effects of their interaction with the Earth's atmosphere.

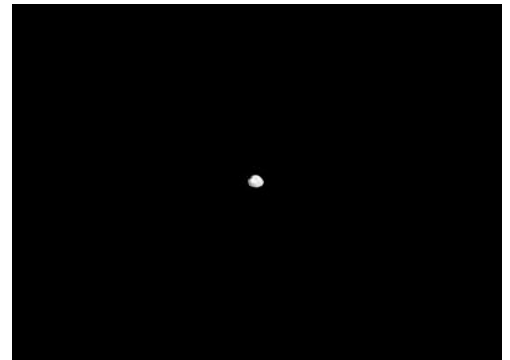
In this Learn article we will break down the most commonly used terms for space rocks and luminous phenomena generated by their interaction with Earth's atmosphere. Some of the terms were made official by the International Astronomical Union, and others are used consensually by scientists.

Meteoroids are objects of natural origin that orbit the Sun. Their size varies between about 30 [micrometres](#) and 1 metre. Objects smaller are called **interplanetary dust**, and the ones bigger than 1 metre are known as **asteroids**.

Meteors are luminous phenomena resulting from the interaction of rocks and fragments coming from space with the Earth's atmosphere. They are usually seen as rapidly moving points of light. The brighter ones do often leave "trails" that last typically for a few seconds. They are popularly called "shooting stars", but meteors are actually not stars.

They are an atmospheric phenomenon and can occur on any planet or natural satellite with a sufficiently dense atmosphere. For instance, there are no meteors on the Moon because it has no atmosphere.

Meteors are often seen sporadically but they can also be observed sequentially at specific times throughout the year. These events are



called [meteor showers](#), and they occur when the Earth passes through the trail of debris left by a comet or asteroid.

When a meteor reaches great brightness, it is named differently. The planet Venus, the brightest celestial body seen from Earth after the Sun and the Moon, becomes the brightness reference to differentiate a meteor from a **fireball**. If a meteor is brighter than the planet Venus, it is considered a fireball. Some fireballs can explode in Earth's atmosphere. If this happens, they are called **bolides**.

Some bolides are so bright that they surpass the brightness of the full moon. If one of them reaches the [magnitude](#) -17 (about 100 times brighter than the full moon), the visible phenomenon will be called a **superbolide**.

If a meteoroid or asteroid survives its passage through Earth's atmosphere and reaches the surface, that fragment is called a **meteorite**, weighing from a few grams to tens of tons. The science that studies meteorites is called meteoritics.

To conclude, asteroids, meteoroids, and meteorites are terms used to designate objects, while meteors, bolides, and superbolides refer to the visible luminous phenomena as the bodies are penetrating down through the atmosphere and these terms do not refer to the objects themselves.

Learn more about these and other terms by visiting these websites:

[Definitions of Meteor Terms - International Astronomical Union](#)

[Meteor Terminology Infographic - American Meteor Society](#)

[International Meteor Organization](#)

