

### **Further information:**

Meteors, or shooting stars, are among the most fascinating celestial phenomena. They are visible as falling stars. A meteor is a small meteoroid (a type of space debris that move in orbits around the Sun) that shines brightly when it enters our atmosphere.

Meteors move at enormous speeds of thousands of kilometers per hour. They ignite in searing temperatures, due to high atmospheric drag, at heights of about 80-110 km above Earth's surface.

From a given location on Earth, on a clear, dark night, a few meteors per hour may be observed. On occasions, however, the rate may increase to 100 meteors per hour or more. This phenomenon is known as meteor shower. A meteor shower occurs when the Earth passes through a meteor stream. Meteor streams are believed to be tiny fragments blasted off comets when they approach the Sun. Several conspicuous meteor showers occur annually.

During a meteor shower, the meteors appear to fall from a particular point in the sky, termed the radiant. The radiant is located along the direction of Earth's motion. A meteor shower is named by the constellation in which the radiant is located. Thus, the Leonids meteors are named after the constellation Leo (the Lion).

Other notable meteor showers include the Perseids, whose radiant lies in the constellation Perseus, and the Ursids, whose radiant lies in the constellation Ursa Major (the Great Bear). A meteor that is not observed to streak from a known radiant is termed sporadic meteor, or a non-shower meteor.

Typically, a shower lasts for several days, but peak activity occurs around a certain date. The Leonids are active between 13 and 20 November every year, but usually peak on the morning of 18 November.

A meteor storm is far stronger than a meteor shower, with rates of over 1000 meteors per hour. The sky then appears to rain stars.

The Leonids are the most famous meteor shower. This is due to their regular outbursts that may be categorized as a meteor storm. Leonid storms may occur every about 33 years. The Leonids of 1833, blazed spectacularly, at a peak rate of about 100,000 meteors per hour. Also, the Leonid displays of 1866 and 1966 were exceptionally strong. Recently, dazzling Leonid displays occurred in 1998, 1999, 2001 and 2002.

Most meteor showers are produced by comets. The parent comet of the Leonids is known as Tempel-Tuttle. It orbits the Sun every 33 years. A comet is a few kilometers across; it resembles an iceberg, as it consists of ice and dust. Comets are also dubbed "dirty snow balls".

Every time Tempel-Tuttle approaches the Sun, the ice sublimates and dust is blasted into space, due to solar radiation. Eventually, the cometary debris spreads along the comet's orbit, with a dense trail of dust lying close to the comet. This trail gets replenished every 33 years, when the comet is nearest to the Sun. When Earth passes

through the trail of dust, a spectacular meteor shower or even a meteor storm is observed. This is observed at intervals of about 33 years.

This year, Earth will pass through a concentration of Temple-Tuttle's debris, a trail of dust released by the comet in 1932. This is expected to result in a strong shower with a peak activity of over 100 meteors per hour, visible from parts in Western Europe and Western Africa. Notable activity would be observable from Egypt during the predawn hours. The observation should be performed from midnight to sunrise.

The meteors will appear to be streaking from a particular point in the sky, termed the radiant. The radiant will be located about  $30^\circ$  above the crescent Moon. The meteors will be seen in all parts of the sky. You may look preferably in the western sky (in Alexandria, the sea is to the West).

You do not need any optical instruments, e.g., a telescope or binocular, to observe the meteors. They can be observed with the unaided eye, but the observer is rather recommended to observe from a dark site, away from urban light pollution.

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