

Here come the Leonids

By Colin Johnston, Science Communicator

The Leonids are one of the many annual meteor showers. The name comes from how they appear to emerge from the constellation Leo- the term for their apparent point of origin is the Radiant.

The Leonids tend to be brighter than average meteors and they are also very fast by meteor standards. They enter Earth's atmosphere traveling at speeds of over 253 000 km/h (158 000 mph). In contrast the Stardust capsule, the fastest vehicle ever to re-enter the Earth's atmosphere, returned at a snail-like 46 440 km/h. The Leonids we will see in our skies began their one-way trip to Earth in a dim comet called Tempel-Tuttle (named for its discoverers- Ernst Tempel was an especially prominent comet hunter). The comet was discovered 140 years ago and returns every 33 years. Comets have been traditionally described as 'dirty snowballs' as they have surfaces rich in frozen water and dusty grit- though results from NASA's Deep Impact probe's visit to Comet Tempel 1 (another found by Ernst Tempel) suggest the proportions of the ingredients are different from those expected. Perhaps we will have to start to call them 'snowy dirtballs' instead. Whatever the exact details, the Sun's heat releases the dust and grit from the comet's surface which ends up spread along the comet's orbit. The orbits of the comet and the Earth intersect and every so often, at regular intervals, the Earth ploughs into the oncoming dust, resulting in a shower of meteors.

Every 17-19 November Earth crosses Tempel-Tuttle's orbit and the Leonids become visible. With clear, dark skies observers may see 10 to 15 Leonid meteors every hour on those mornings. The rate of meteors observed is called the Zenith Hourly Rate, so this is a ZHR of 10-15. You should start watching sometime after about 11:30 pm (1130 UT). Leo will be in the eastern sky.

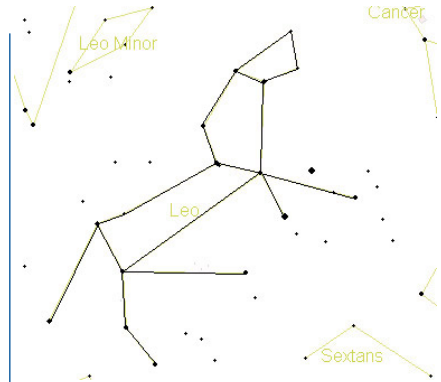


Image Credit: Colin Johnston, Science Communicator

Leo The Leonid Meteors have their radiant in this constellation. Image created with Starry Night software

The density of the material of the trail is not uniform, and tends to be replenished after the comet has been through one of its periodic solar warmings. Occasionally the Earth passes through a thicker than average patch. Then we are treated to an even more spectacular display, a meteor storm.

This has happened recently; displays of 250-300 per hour were observed in 1998, an astonishing 3700 per hour occurred in 1999, and 480 per hour occurred in 2000. Predictions of meteor shower activities based on modeling the dust trails along the comet's orbit are getting more and more accurate. David Asher of Armagh Observatory has predicted a heavy shower this year. He has calculated that a short and sharp outburst will occur at about 0445 on 19 November (with an uncertainty of about 10 minutes to either side). The ZHR may reach as high as 120 during the outburst.

To see this spectacle you will need to be watching from a dark site with minimal light pollution, if you are fortunate enough to know of such a place, why not have a go at observing? You may be in for a stunning natural fireworks display!