Dramatic display forecast for 2011 Draconid meteor shower

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The Draconid meteor shower is expected to produce unusually high peak meteor rates of 1,000 per hour on October 8, 2011.

A typical strong meteor shower, like the Perseid shower which occurs every summer in mid-August, might produce up to 100 meteors per hour under favorable skies. Normally the Draconids (so-named because its meteors appear to radiate from the northern constellation Draco) are a weak shower producing perhaps 10 meteors per hour. However, this shower has proved strongly variable in the past. In 1933 and 1946, the Draconids produced "meteor storms" where shooting stars were produced at rates of 10,000 per hour or even more. Other less dramatic outbursts -- where the meteor counts nonetheless ran into the hundreds per hour -- occurred in 1952, 1985, and 1998.

The 2011 Draconid outburst is expected to occur between 17:00 and 18:00 Universal Time on October 8, 2011. Unfortunately this translates into between 1 and 2 pm Eastern Daylight Time on October 8, which means that the peak of the shower occurs during daylight hours in North America. The best locations from which to view the shower, which is only visible in the northern hemisphere, will be Europe, North Africa, and the Middle East.

Though the peak of the outburst will occur during daylight in Canada, the shower is expected to continue to produce meteors, albeit it at a reduced level, into the evening of October 8. So Canadians will still have a chance to see the meteor shower. "And you never know", says

University of Western Ontario astronomer Paul Wiegert, who is presenting his results at this week's CASCA 2011 meeting in Ontario, Canada, "meteor showers are as difficult to predict as rain showers. The Draconids have surprised us before, and they may do so again. I'd encourage anyone outside on the night of October the 8th to look to the northern skies, just in case."

Comet Giacobini-Zinner is the source of the Draconid meteor shower and was the first comet to be examined by a spacecraft, when in 1985 the International Cometary Explorer flew through its tail, passing approximately 7,800 km from its nucleus.

A comet's tail may extend for millions of km but that spectacular display all originates from the much-smaller nucleus at its head. Essentially an ice asteroid, the frozen nucleus partly evaporates when its orbit brings it close to the Sun. At this time the comet's tail, which is composed largely of water vapor and chemically related species, grows in size and may achieve naked-eye visibility from Earth. The vaporization process also releases copious quantities of small rocks and dust because the nucleus is far from pristine ice: it is more like a dirty city snow-bank after a long winter.

The solid rocky material produced by a comet continues to orbit the Sun after its release. If that orbit brings it into collision with the Earth its high speed -- which may exceed 250,000 km/h -- causes it to burn up in the upper atmosphere and produce a bright flash we call a meteor, shooting star or falling star. Particles no larger than a pea and which burn up at altitudes of 100 km are easily noticeable from the ground; in fact, this describes most meteors visible to the human eye. When these particles arrive in large numbers, they produce a beautiful display called a meteor shower.

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