

# The 2009 Leonid Meteor Shower

November 10 2009, by Dr. Tony Phillips

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This side of Earth will be facing the Leonid debris stream at the time of the Nov. 17th outburst. Observers in India, China and Indonesia are favored with dark, pre-dawn skies. Image credit: Danielle Moser of the NASA Meteoroid Environment Office.

This year's Leonid meteor shower peaks on Tuesday, Nov. 17th. If forecasters are correct, the shower should produce a mild but pretty sprinkling of meteors over North America followed by a more intense outburst over Asia. The phase of the Moon will be new, setting the stage for what could be one of the best Leonid showers in years.

"We're predicting 20 to 30 [meteors](#) per hour over the Americas, and as many as 200 to 300 per hour over Asia," says Bill Cooke of NASA's [Meteoroid](#) Environment Office. "Our forecast is in good accord with

independent theoretical work by other astronomers."

Leonids are bits of debris from Comet Tempel-Tuttle. Every 33 years the comet visits the [inner solar system](#) and leaves a stream of dusty debris in its wake. Many of these streams have drifted across the November portion of Earth's orbit. Whenever we hit one, meteors come flying out of the constellation Leo.

"We can predict when Earth will cross a debris stream with pretty good accuracy," says Cooke. "The intensity of the display is less certain, though, because we don't know how much debris is in each stream." Caveat observer!

The first stream crossing on Nov. 17th comes around 0900 UT (4 a.m. EST, 1 a.m. PST). The debris is a diffuse mix of particles from several old streams that should produce a gentle display of two to three dozen meteors per hour over North America. Dark skies are recommended for full effect.

"A remarkable feature of this year's shower is that Leonids will appear to be shooting almost directly out of the planet Mars," notes Cooke.

It's just a coincidence. This year, Mars happens to be passing by the Leonid radiant at the time of the shower. The Red Planet is almost twice as bright as a first magnitude star, so it makes an eye-catching companion for the Leonids: [sky map](#).

The next stream crossing straddles the hour 2100-2200 UT, shortly before dawn in Indonesia and China. At that time, Earth will pass through a pair of streams laid down by Comet Tempel-Tuttle in 1466 and 1533 AD. The double crossing could yield as many as 300 Leonids per hour.

"Even if rates are only half that number, it would still be one of the best showers of the year," says Cooke.

The Leonids are famous for storming, most recently in 1999-2002 when deep crossings of Tempel-Tuttle's debris streams produced outbursts of more than 1000 meteors per hour. The Leonids of 2009 won't be like that, but it only takes one bright Leonid streaking past Mars to make the night worthwhile.

Enjoy the show.

Source: Science@NASA, by Dr. Tony Phillips

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