

Stars over Sisters

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Correspondents

The arrival of November is a reminder that autumn is deepening. Deciduous leaves (what's left of them) are changing color and the spooky season is over. There is a shift toward colder weather, while a similar shift plays out in the sky above as "new" constellations wheel into view.

Many people don't pay much attention to the night sky, which is a shame because there are so many wonderful things going on there!

Over the years November has become known for its annual meteor shower. This shower is called the Leonids, as the meteors seem to emerge from the well-known constellation of Leo the Lion. The source of these meteors are tiny dust and ice debris from comet Tempel-Tuttle that enter the earth's atmosphere and are incinerated by the heat of friction, thus producing the shooting stars.

At its peak this reliable shower normally produces a relatively low 10 to 15 meteors per hour. But sometimes, when the "Lion" roars, a spectacular meteor storm is the result.

The most astonishing meteor display ever recorded in modern history occurred on November 13, 1833. For approximately nine hours, the sky was filled

with thousands of meteors that were best seen over the entire region of North America east of the Rocky Mountains. Thanks in part to the absence of electric outdoor lighting during that time, one estimate of the peak rate was over 100,000 meteors an hour, painting the sky with beautiful streaks of light!

But not everyone rejoiced in the cosmic celebration. Many religious leaders, and others too, feared the display might signal the end of days, as predicted by a Bible verse: "and the stars of heaven shall fall." In the weeks that followed, however, science explained the event as a natural phenomenon.

In 1966 another Leonid storm lit up the heavens, this time favoring the western part of North America. At its peak, between the hours of midnight and dawn on November 17, hourly meteor rates were in the neighborhood of 80,000 (more than 20 meteors per second)! It happened again in 2001 when in the early morning hours of November 18 about 3 meteors per second were observed in the western U.S. and Hawaii. To be called a storm, the hourly rate must exceed 1,000 meteors per hour.

These storms coincide with when the comet is near perihelion (closest to the sun it its orbit). Since Tempel-Tuttle has an orbital period of about 33 years, one would

expect the next storm to arrive in 2033 or 2034. But there is a potential complication. Some astronomers say the gravitational influence of Jupiter is expected to alter the comet's orbit in 2028, perhaps causing the earth to miss the densest part of the debris field. We shall see.

As for the Leonids this month, the peak of the shower is expected to occur between midnight and dawn on Monday, November 18. But a waning gibbous moon will likely wash out all but the brightest shooting stars. If you're still up to trying to observe the shower, make sure you're comfortable and dress in layers against the cold. Sipping a hot drink to warm up the insides wouldn't be a bad idea either.

Our inner-most planet journeys from the evening to the morning sky this month, and in doing so transits (moves in front of) the sun on November 11. This is a rare event since Mercury transits occur just 13 times per century, on average, and always during the months of May or November. When the sun rises in our part of the world on the morning of the event (approximately 7 a.m. PST) the speedy planet will have already traveled nearly halfway across the sun. The transit will end at 10:04 a.m. To witness the event you need a telescope, or at the very least a pair of binoculars, fitted with



[66] METEORIC SHOWER OF NOV 13, 1833. PHOTO PUBLIC DOMAIN

Engraving made by Adolf Vollmy in 1889 depicting the Leonid meteor storm of 1833.

proper solar filters. Never view the sun directly without this protection! Look for a tiny black dot on the sun's face.

Though moving in opposite directions, Venus and Jupiter will converge in the southwestern sky this month,

approaching to within 1.5 degrees of each other on November 24. Saturn continues to linger in the same part of the sky as well. Mars and Mercury (after its transit across the sun on November 11) will populate the morning realm.

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