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<th>8/18/16</th>
<th>What are Meteors??</th>
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<td>Question: What are 6 observations we can make about Meteors?</td>
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<td>1) Question &amp; TOC</td>
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1) Some meteors are brighter than others.
2) Some are faster than others.
3) Some meteors curve a little.
4) None were going in the same direction.
5) Camera did not change position.
6) More meteors than usual.
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<td>1 Welcome to Astronomy</td>
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Perseids: Bright Meteor Shower in August

By Elizabeth Howell, Space.com Contributor | August 1, 2016 08:30am
Space.com.Skywatching

The Perseid meteor shower happens every August. The Earth plows into debris left behind from Comet Swift-Tuttle, which last passed close to Earth in 1992. For 2016, the Perseids will be visible from July 17 to Aug. 24, with a peak during the overnight hours of Aug. 11 and 12. You can find out exactly what to look for this year in our 2016 Perseid Meteor Shower Observing Guide.

While the comet poses no threat to the planet for the foreseeable future, it is a very large object. Its nucleus of 6 miles (9.7 kilometers) in diameter is about the same size as the one that crashed into Earth about 66 million years ago and killed the dinosaurs.

Swift-Tuttle was discovered independently by two astronomers, Lewis Swift and Horace Tuttle, in 1862. When it last made a pass by Earth in 1992, it was too faint to be seen with the naked eye. The next pass, in 2126, could make it a naked-eye comet similar in brightness to the 1997 Hale-Bopp comet — providing that predictions are correct.
A prediction from a few years ago said that Swift-Tuttle could collide with Earth during its next pass, but examining the record of past comets showed that its orbit is far more stable than that. Swift-Tuttle poses no danger to Earth for the foreseeable future, although in a millennium it is expected to pass within a million miles (1.7 million kilometers) of the planet.

**Characteristics of the Perseids**

Meteor showers are named after the constellation from which the meteors appear to emanate. From Earth’s perspective, the Perseids appear to come approximately from the direction of the Northern Hemisphere constellation Perseus. The constellation’s position in the sky is:

- Right ascension: 3 hours
- Declination: 45 degrees
- Visible between latitudes 90 and -35 degrees

A typical Perseid meteoroid (which is what they're called while in space) moves at 133,200 mph (214,365 kph) when it hits Earth’s atmosphere (and then they are called meteors). Most of the Perseids are tiny, about the size of a sand grain. Peak activity is about 60 meteors per hour, according to NASA. Almost none hit the ground, but if one does, it’s called a meteorite.

Peak temperatures for Perseids are more than 3,000 degrees Fahrenheit (1,650 Celsius) as each fragment travels through the atmosphere and both compresses and heats the air in front of it. Most of the fragments are visible when they are about 60 miles (97 kilometers) from the ground.

The meteors are bright, and showers take place during August, which is an easy time for amateur astronomers to stay outside in the Northern Hemisphere, as it is summertime. The Perseids are also one of the most well-known showers, NASA noted. "The Perseids are typically fast and bright meteors that frequently leave trails," the agency wrote. For years before and after Swift-Tuttle’s return in 1992, the Perseids had a spectacular run where amateur astronomers would see as many as several hundred meteors an hour.
"The most likely reason was that the Perseids parent comet was itself passing through the inner solar system and that the streams of Perseid meteoroids in the comet's vicinity were larger and more thickly clumped together, leading to brighter meteors as well as much-higher-than-normal meteor rates," wrote SPACE.com skywatching columnist Joe Rao in a past SPACE.com article.

Night sky watcher David Kingham took this photo of the Perseid meteor shower from Snowy Range in Wyoming on August 12, 2012.

Credit: David Kingham/DavidKinghamPhotography
In the decades since, however, activity has fallen more to normal levels — although astronomers still characterize the shower as one of the best to watch every year. As of August 2013, the comet was more than 3.2 billion miles (5.1 billion kilometers) away from Earth.

**Collision with Earth?**

One astronomer — in calculating Swift-Tuttle's orbit — once suggested that it could come dangerously close to Earth in 2126 and possibly collide with the planet. Further refinements, however, show that the comet will not, according to the Astronomical Society of the Pacific.

Swift-Tuttle's pass by Earth in the year 3044 could bring it within a million miles of our planet. That's just over twice the distance from the Earth to the moon, making the comet very close in astronomical terms. The uncertainty came because initial projections for Swift-Tuttle's path through space came from only three months of observations in the 1860s, when the comet was first discovered, the society added.

In the 1970s, astronomers noted that the number of annual Perseids meteors was increasing, suggesting that the comet would make an appearance soon. "But it failed to show, and soon afterward, Perseid meteor activity dropped sharply. Astronomers wondered if the comet had somehow come and gone unnoticed," the society wrote.

Brian Marsden, who was an astronomer with the Harvard-Smithsonian Center for Astrophysics, suggested in 1973 that Swift-Tuttle might be the same comet as seen in 1737 by a Jesuit missionary in China.

Marsden suggested the comet would return in 1992, which it did, but its closest approach was 17 days' different from his prediction. He continued tweaking his calculations. Although he initially predicted a possible collision in 2126, he examined the historical record and found observations of a comet in a similar track as far back as at least 188 A.D. — allowing him to calculate the comet would pose no harm. "His new calculations show Comet Swift-Tuttle will pass a comfortable 15 million miles from Earth on its next trip to the inner solar system," the society wrote.