

Leonid Meteors Make Brilliant Display

Astronomy

By JAMES STOKLEY

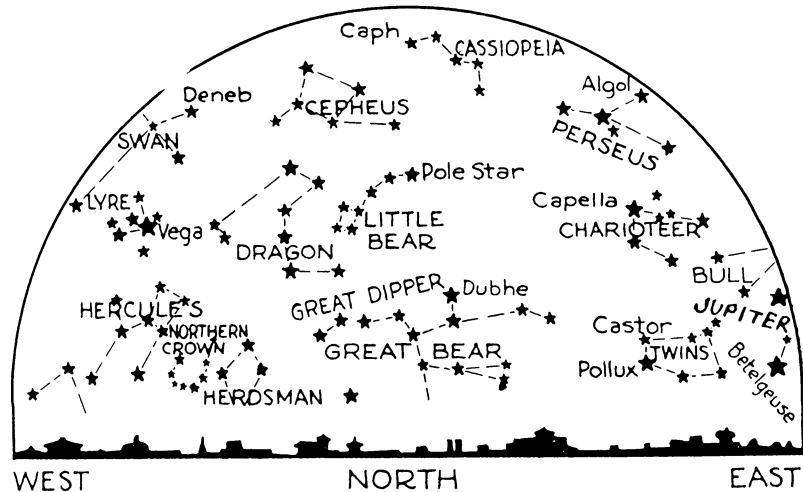
November is one of the two months of the year that are most famed for displays of meteors, or "shooting stars." On Thursday night, November 14, if you look to the northeastern sky at midnight you will see the familiar constellation of Leo, the lion, with the six stars forming the "Sickle". At this time the point of the sickle is uppermost and the handle extends to the south and downward. If the night is clear, your watching should soon be rewarded by the sight of a shooting star flashing from the center of the sickle. A few minutes more and you should see another one; then they should follow in fairly rapid succession.

These are the Leonid meteors, so called because of the constellation from which they seem to radiate. The astronomers are anxious to know how many of these meteors appear, during half-hourly intervals, and as one part of the country may be cloudy, amateurs are invited to aid in this work. All that you need to do is watch the sky, say from twelve to three a. m., and count the number of meteors that you see between twelve and twelve-thirty, twelve-thirty and one, etc. Dr. Charles P. Olivier, at the Flower Observatory of the University of Pennsylvania, in Philadelphia, Pa., is the leading meteor authority, and will be glad to receive any data from laymen.

In 1833 and 1866, the Leonids were extremely numerous. Another such shower was expected in 1899 but did not materialize. The next couple of years, however, did bring an unusually large number of November meteors.

It is thought that 1933 may bring another copious return of them, and if so, they should be getting more numerous now. On this account, observations are more needed now than they have been for some years.

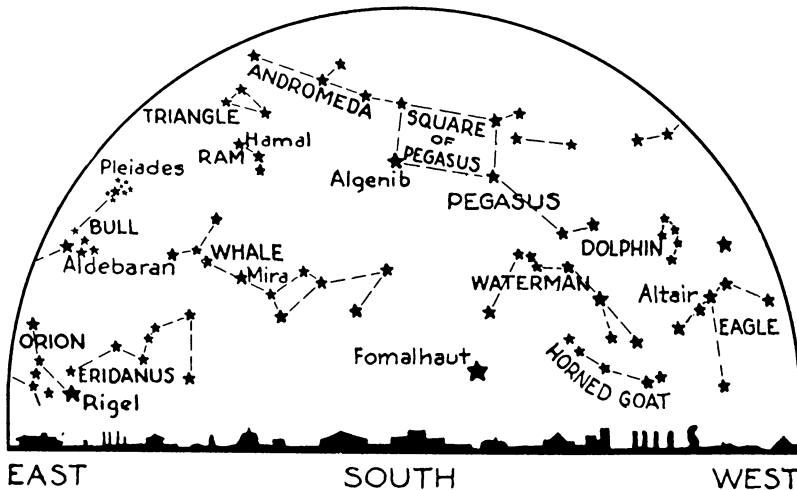
Among the stars this month are some of the most interesting constellations in the sky. In one of them is the most distant object that can be seen with the unaided eye. This is the constellation of Andromeda, the Chained Lady. According to the ancient Greek mythology, Andromeda was the daughter of Cassiopeia, and was punished by being chained to the rock to be devoured by a sea-monster, because her mother had boasted of her beauty. She was rescued by Perseus. Holding the Medusa's head in front of him, he turned the sea-monster that threatened Andromeda to stone, and then rescued that fair lady from her plight.



To locate the constellation of Andromeda in the sky, it is best to start with Pegasus. The great square of Pegasus, shown on the map, is high in the southwest. The northeastern star of this square does not belong to the constellation of Pegasus, but to Andromeda. The other stars of the group run from this corner star, Alpheratz, to the northeast. Starting from Alpheratz, on a dark night, look along the line of bright stars to the third, then in a perpendicular direction to this line to the second of the two major stars. Near this major star, if your eyes are good and the night is dark and clear, you will see a faint hazy patch of light. It covers an area in the sky about the same as that of the full moon, but does not appear so large because it is so much fainter.

One might expect this light to be faint, however, because it is the oldest light that ever enters the unaided human eye, so far as we know. If you look at this spot tonight, the light from it that penetrates the lens of your eye and then shines on the retina, completes a journey that it has been taking for the last 900,000 years. When this light started, the human race had not yet appeared on the surface of the earth; in fact, it was nearly half-way across the intervening gap before our remotest human ancestors developed. During all this period it has been travelling at a speed of 186,000 miles per second, great enough to take us around the world in the seventh part of a second.

This object that we see by such an ancient light is known to astronomers as the Great Nebula of Andromeda. It is cer- (Turn to next page)



HOLD THESE MAPS in front of you and face North or South. The upper or lower one will then show the stars of the November evening sky

Leonid Meteors Make Brilliant Display—Continued

tain that it was known as far back as the year 905. The Arabian astronomer Al Susi described it as the "Little Cloud," before 986. On a Dutch star map published in 1500 it is also indicated. One of the earliest astronomers to use the telescope, Simon Marius, wrote that he first examined it with a telescope on December 15, 1612. This was just about two years after Galileo first looked at the stars through a telescope at all.

It remained for the much maligned "Gay Nineties" to reveal its chief characteristic. Nearly a century ago the Irish nobleman and amateur astronomer, the Earl of Rosse, discovered the first of the spiral nebulae. This is an object in the constellation of the hunting dogs, that looks like a celestial pin-wheel firework. With his great telescope, he also discovered several other spiral nebulae and introduced these interesting objects to astronomers. The object in Andromeda, however, did not appear spiral to him. During the nineties, another English astronomer, Sir Isaac Roberts, made the finest astronomical photographs that had been made up to his time. One of these was of the object in Andromeda and here it appeared for the first time with a spiral structure, showing that it, too, belonged to this rather large class of objects.

The true nature of the spiral nebulae was explained several years ago, after much controversy by astronomers, by Dr. Edwin P. Hubble of the Mt. Wilson Observatory in California. Using the great 100-inch telescope of the observatory, still the largest in the world but soon to be exceeded, he photographed the actual stars of which the Andromeda nebula consists. Just as the Milky Way appears to be a continuous band of hazy light to the naked eye, and is revealed by even such slight optical aid as a pair of opera glasses to be stars, so does the Andromeda nebula appear to be continuous in all but the very largest of instruments. Therefore, it was proved that it was a "universe" of stars, like our own, but beyond its limit. He was also able to measure its distance and found that it is 900,000 light years from us. A light year is equal to about six trillion miles. This is the nearest of a class of objects that have been called "island universes," but which are better designated by a name coined by Dr. Harlow Shapley, of the Harvard

College Observatory, "galactons."

Following the line of bright stars from Alpheratz, a little beyond Andromeda, to the next constellation and then going a little to the south, one can locate the remarkable star Algol, in Perseus. This has long been known as the "Demon Star" because of its strange behavior. If you watch it night after night, you will find that on the evenings of Tuesday, November 12, Friday, November 15, and in the early morning hours of Sunday, November 10, and Saturday, November 30, it will be much fainter than at other times. For two days and eleven hours Algol remains of the same brightness, a little bit fainter than the second magnitude. Then in five hours it decreases to the 3.5 magnitude, and in another five hours returns to its normal state. The English astronomer, Goodricke, explained this mysterious behavior in 1782, when he suggested that the star was really double. One part of it, he said, is a bright body which we see, the other is a dark body which periodically revolves in front of the brighter one and partially eclipses it. Further studies since his time have shown the truth of his suggestion.

Whether on account of its variation, or not, Algol has long been associated with misery and misfortune. Its very name comes from the Arabic Al Ghul, meaning a mischief-maker, which is similar to the English word ghoul. The Chinese call it Tseih Sat, meaning the piled-up corpses. The Hebrews called it Rosh ha Satan, or Satan's head. On the old star map it represented the eye of the head of Medusa, which Perseus was carrying after he had slain her. It will be recalled, of course, that anyone who looked on Medusa's head immediately turned to stone, and Perseus caught her by watching her reflection in a polished shield.

A number of other bright stars are visible this month. Low in the northwestern sky is the constellation of Lyra, the lyre, containing the brilliant Vega. Directly west, about the same height above the horizon, is Aquila, the eagle, containing the brilliant Altair. Above Lyra is Cygnus, the swan, or Northern Cross, containing at the top of the cross, the first magnitude Deneb. Over in the eastern sky this month, one sees Orion, one of the most magnificent of all constellations, coming into view. The three,

stars of Orion's belt are now upright in the eastern sky, a little to the south. To the north of the belt is the famous star Betelgeuse, which has as many different ways of pronouncing it as there are astronomers. To the south is Rigel. Above Orion is Taurus, the bull, with the red Aldebaran marking the bull's eye. Back of Taurus is Auriga, the charioteer, with Capella, another star of the first magnitude. Low in the southwest is Fomaulhaut, in Piscis Austrinus, the southern fish, one of the southernmost of all stars that we can see from this latitude. Jupiter is the most conspicuous planet in the evening sky during this month. On the 15th it will rise about 5.30 p. m., in the constellation of Taurus, and remain in view throughout the night. Its brilliancy, greater than that of any stars nearby, leaves no doubt as to its identity. Also, it shines with the steady light characteristic of the planets, and differing from the scintillation of the stars. Saturn has just about passed from view. It sets about two hours after the sun on the 15th, but is so low at twilight, that it will be hard to make out at all. In the morning sky, just before sunrise, Venus can be seen.

Science News-Letter, November 9, 1929

Aluminum chloride is now successfully used in making gasoline from high boiling petroleum oils.

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