

☼ \* ○ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

# Winter constellations appear

by James Stokley

During November Saturn continues to shine in the southern evening sky.

In the west, sky watchers have their last glimpses of stars prominent on summer evenings. To the east the constellations that brighten the winter evening skies are coming into view.

All of these are shown on the accompanying maps, which depict the sky as it looks about 10:00 p.m., local standard time, on Nov. 1. It looks about the same an hour earlier at the middle of the month, and two hours earlier at the end.

To the northwest shines Vega, in Lyra, the lyre. Above it is Cygnus, the swan, with Deneb, another first magnitude star. Deneb stands at the top of

a figure called the Northern Cross. To the left of Deneb is Altair (on the southern sky map), in Aquila, the eagle.

High in the northeast is Capella, in Auriga, the charioteer. Alongside, to the right, stands Taurus, the bull. Red Aldebaran marks the animal's eye. Below is Orion, the mighty warrior, now seen lying on his back. Three stars in a vertical row form his belt.

To the right is Rigel and to the left Betelgeuse. Both stars are first magnitude but the latter is represented by the symbol for one that is fainter. This is because the light of a star so low in the sky is considerably absorbed by the earth's atmosphere.

Also dimmed by such absorption is

Fomalhaut, low in the southwest in Piscis Austrinus, the southern fish.

Four stars about Saturn form the Great Square. Three are in Pegasus, the winged horse; Alpheratz, in the upper left, is in neighboring Andromeda. According to mythology, she was a princess chained to a rock.

High in the north, under Andromeda is her mother, Cassiopeia. Its five chief stars form a letter M. Lower is the little bear, Ursa Minor, of which the Little

## CELESTIAL TIMETABLE

Nov.	EST	
1	10:00 a.m.	Mercury between earth and sun
	9:00 p.m.	Moon nearest, distance 221,800 miles
2	12:49 a.m.	New moon
6	1:50 a.m.	Algol (variable star in Perseus) at minimum brightness
	4:00 a.m.	Moon passes south of Mars
7	5:00 a.m.	Venus close to Uranus
8	8:00 p.m.	Moon in first quarter
	10:40 a.m.	Algol at minimum
9	10:00 a.m.	Venus farthest west of sun
11	7:30 p.m.	Algol at minimum
12	11:00 p.m.	Moon passes north of Saturn
15	3:00 a.m.	Moon farthest, distance 252,400 miles
16	11:53 p.m.	Full moon
17	early a.m.	Some meteors of Leonid shower visible in northeast, apparently radiating from constellation of Leo
	4:00 p.m.	Mercury farthest west of sun; visible for a few days around this date low in southeast before sunrise
24	7:24 p.m.	Moon in last quarter
	10:00 p.m.	Moon passes north of Jupiter
28	6:00 a.m.	Moon passes south of Venus
29	12:20 a.m.	Algol at minimum
30	9:00 a.m.	Moon nearest, distance 223,100 miles



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Dipper is part. Here we find Polaris, the pole star.

Lower, to the right, is Ursa Major, the great bear. However, the most familiar part of this constellation, the Big Dipper, is close to the horizon, in its poorest evening position of the year.

To the right of Cassiopeia stands Perseus, the hero who rescued Andromeda. Algol in this group is marked—not because it is very bright—but because it is a well known variable star.

Algol consists of two stars, one much fainter than the other. Every 2.9 days the fainter star passes in front of the brighter one. This produces a partial eclipse and the system loses about two-thirds of its light.

Mars still is visible in the early evening. It is in Sagittarius, the archer in the southwest, west of Capricornus.

On Nov. 17 Mercury will be farthest west of the sun, rising about an hour and a half before sunrise. For a few days around this date you can see Mercury low in the southeast in the morning twilight. Jupiter rises in the east soon after midnight. It is followed by Venus, brighter than any other star or planet, which appears nearly four hours before sunrise.

The moon, in its monthly trip around the earth, will pass Saturn on the evening of Sunday, Nov. 12. From some places on the earth, including the western parts of North America, it will actually pass in front of the planet. In the eastern parts the moon will set before the occultation takes place.

On Nov. 7 Venus will pass south of Uranus, which is the next planet out from the sun beyond Neptune. Ordinarily Uranus is not considered a naked-eye planet, but it does get a little brighter than the sixth magnitude. This usually is regarded as the limit of naked eye visibility, with the most favorable conditions: a dark, clear sky, far away from the haze and glare of a city. Under such circumstances, Uranus can sometimes be seen without a telescope.

November also brings the year's fourth eclipse—on Nov. 2. Few, if any, persons will see it, even though it is a total eclipse of the sun and astronomers often travel half-way around the earth to observe such a phenomenon.

Last November, for example, thousands of astronomers and other scientists traveled to a path across South America, where a total eclipse could be observed.

This time the area of totality is a small semicircle in the South Atlantic Ocean near Antarctica. It includes no land.

Over a larger region, however, including South Africa and most of the Antarctic continent, the moon will produce a partial eclipse.

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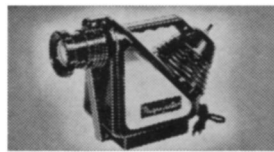
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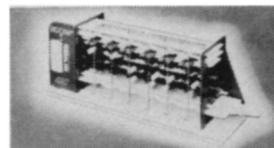
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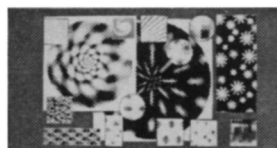
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