

## ASTRONOMY

# Bright Stars Now Prominent

Two bright planets, Venus and Jupiter, join the stars of Orion, Canis Major and Gemini to make a brilliant display in the February evening skies.

By JAMES STOKLEY

► TO THE NORMALLY BRILLIANT skies of February evenings are added two bright planets. These join with the bright stars of Orion, a Canis Major, Gemini and their neighbors to make a fine display.

Brightest of the planets is Venus, of magnitude minus 3.6 on the astronomical scale. It appears in the west soon after sunset—long ahead of any star, or any other planet—and remains until the sky is completely dark.

However, Venus is not shown on the accompanying maps because it sets before the times for which they are drawn: 10:00 p.m., your own kind of standard time at the first of the month; 9:00 p.m. at the middle; 8:00 p.m. at the end.

A little higher and to the left of Venus is the other planet, Jupiter, about a sixth as bright as Venus, but still a very bright object.

Jupiter barely makes the star map, just above the western horizon. In this position the absorption of its light by our atmosphere dims it greatly from the way it appears a little earlier—when it is higher in the sky.

## Venus Draws Closer to Earth

Swinging around the eastern side of the sun, Venus is now drawing closer to the earth. About 95 million miles away on Feb. 1, it will be about 94.2 million miles distant on the 15th of the month and about one million miles closer than that on the 29th.

Jupiter, on the other hand, is now drawing away. Its distance of 494 million miles on Feb. 1 will increase to 512 million miles on the 15th and 528 million on the 29th.

Saturn is not visible this month—on the 15th it will be directly behind the sun. The following day Mars also passes behind the sun, so it is not visible either this month. Mercury rises a little ahead of the sun but not enough to make it visible.

In the southern sky are the brilliant constellations that make the winter evening skies so glorious. Brightest of all the stars is Sirius, the "dog-star," in Canis Major, the great dog. Higher and to the right stands Orion, the warrior. Three stars in a row mark his belt; above the belt is Betelgeuse and below the belt is Rigel.

To the right of Orion is Taurus, the bull, with a red star called Aldebaran. Above this group is Auriga, the charioteer, of which Capella is the brightest star. Now moving toward the southeast, we come to Gemini, the twins, with the bright stars, Castor and Pollux. But they are not identical twins, for the two stars that bear their names differ in brightness. Pollux, the more bril-

liant, is a first magnitude star, while Castor is only second magnitude. Continuing down toward Sirius, we come to the bright star Procyon, in Canis Minor, the little dog. East of the twins is Leo, the lion. Here is the star named Regulus, in a little group called the sickle.

February 1964 marks an important astronomical anniversary, for it was February 1564, just four centuries ago, that one of the greatest astronomers of all time was born. This was the Italian, Galileo Galilei. Like Napoleon Bonaparte, and the artist Raphael Sanzio, he is generally known by his first name.

If they had a calendar in the Galilei home the day that Galileo was born, it indicated the date as Feb. 15. In 1964, however, Feb. 28 will be exactly 400 years to the day after the date of his birth. The reason is that Italy was then using the old Julian calendar; our present Gregorian calendar was not introduced until 1582. In this 20th century you must add 13 days to convert our Gregorian date to the corresponding date in the Julian calendar.

Galileo achieved fame as a physicist, as a mathematician and as an astronomer. It is the latter that concerns us here. He was the first to study the skies through a telescope.

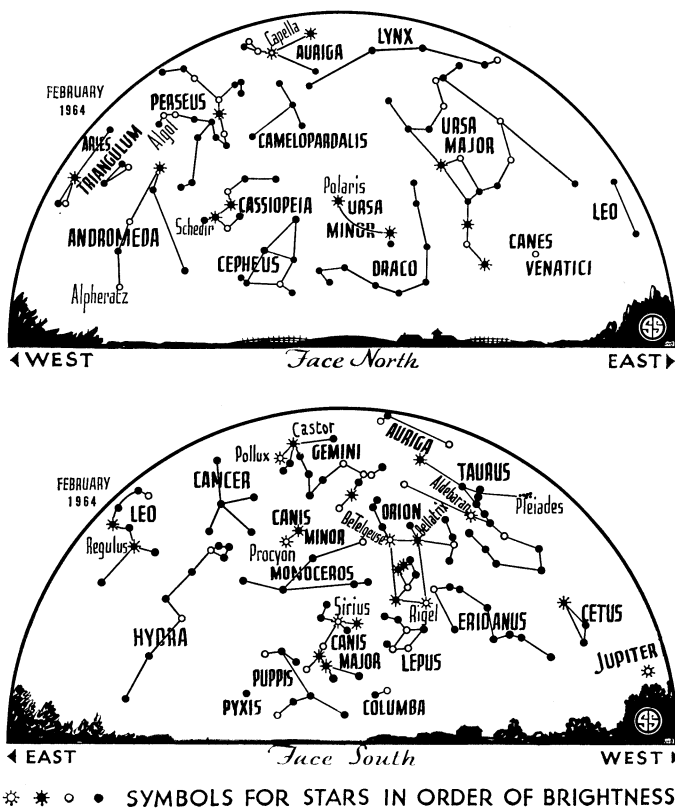
Although several people have been credited with the invention of the telescope, it is most generally ascribed to a spectacle maker, Hans Lippershey of Middelburg, Holland. According to one story, which is probably apocryphal, his two children were in his shop one day, playing with some lenses. They would hold them up and look through them—sometimes through two lenses. One suddenly exclaimed in wonder, for two lenses held apart made the weather vane on a distant steeple look closer.

## Telescope Invented

In any event, Lippershey did find that if he put the right lenses at two ends of a tube, he had what we now call a telescope. In fact, on Oct. 2, 1608, he applied to the States-General of Holland for a patent, but it was not granted. However, he made telescopes and sold them, and so did other opticians, but they were regarded as no more than a novelty, with little practical value.

But in May 1609 while on a visit to Venice, Galileo heard of the new device, which had not yet reached Italy. Without any details, but with the aid of his knowledge of optics, he made a small telescope. Later he made others, more and more powerful.

On the night of Jan. 7, 1610, he looked through one at the planet Jupiter. Alongside he noticed what he first thought were three stars in the same direction. But on succeeding nights he found that these



bodies, as well as a fourth, seemed to be revolving around Jupiter. They were satellites, going around Jupiter as the moon encircles the earth.

At that time it was widely believed that sun, moon and planets all revolved around the earth, as envisioned by the old Ptolemaic theory. But Galileo favored the newer theory that Copernicus had proposed in 1543. This had the earth one of the planets, orbiting around the sun. Jupiter, with its moons, provided a small model of this idea, and so helped to get it accepted.

Later Galileo found that Venus underwent a complete change in phase, like the moon, from a narrow crescent, to full, then back to a crescent. This could not happen in the Ptolemaic system, but it could according to Copernicus. He also discovered craters and mountains on the moon and spots on the sun. The Milky Way, he discovered, was made of a swarm of distant stars, each too faint to be seen by the naked eye, although the telescope revealed them.

Thus Galileo originated the modern era of observational astronomy with the aid of the telescope, which has given us so much information about the universe in which we live. No wonder that astronomers in February will look back for a moment to this great Italian, who was born 400 years ago.

### Celestial Time Table for February

FEB.	EST	
5	7:43 a.m.	Moon in last quarter
6	3:00 p.m.	Moon farthest, distance 251,300 miles
13	2:20 a.m.	Algol (variable star in Perseus) at minimum brightness
	8:02 a.m.	New moon
15	1:00 a.m.	Saturn behind sun
	11:10 p.m.	Algol at minimum
16	8:00 a.m.	Moon passes Venus
	10:00 p.m.	Mars behind sun
17	4:00 a.m.	Moon passes Jupiter
18	8:00 p.m.	Algol at minimum
20	8:25 a.m.	Moon in first quarter
21	3:00 a.m.	Moon nearest, distance 230,000 miles
27	7:40 a.m.	Full moon
28	3:00 a.m.	Venus passes Jupiter

Subtract one hour for CST, two hours for MST, and three hours for PST.

• Science News Letter, 85:58 Jan. 25, 1964

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Pulsed laser light can carry enormous amounts of information such as television pictures or masses of scientific data from a space station. IBM will build a highly simplified system for early testing.

• Science News Letter, 85:59 Jan. 25, 1964

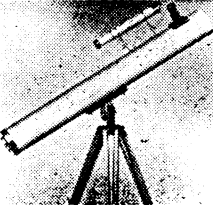
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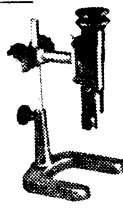
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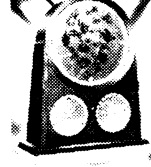
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