



ASTRONOMY

# Saturn Now Visible

Saturn, the prominent planet in the August sky, shines in the east, while Vega, summer's brightest star, shines overhead—By James Stokley

► THE ABSENCE of prominent planets from the evening skies during the last two months will be relieved in August when Saturn appears. On the first of the month it rises almost directly east about two hours after sunset.

Each following night Saturn comes up a little earlier, appearing about an hour after sunset at the end of August. After rising, Saturn remains in view the rest of the night, standing in the constellation of Pisces, the fishes.

The accompanying maps show how the sky looks about 11:00 p.m., your own kind of daylight saving time, on Aug. 1. It looks about the same at 10:00 p.m. Aug. 15 and 9:00 p.m. at the month's end. Saturn is shown low in the east on the southern sky map, with one star of Pisces above it.

Vega, the brightest star of the summer evening, shines almost directly overhead, in Lyra, the lyre. Directly east of Lyra, shown partly on each of the maps, stands Cygnus, the swan, with the bright star called Deneb. Below Vega toward the south is Aquila, the eagle, of which Altair is the brightest star.

Low in the south is Scorpio, the scorpion, with Antares. To the left stands Sagittarius, the archer. Both of these are constellations of the zodiac, the band across the sky through which the sun, moon and planets seem to move. Actually, it is the distant background that we see behind these objects.

Twelve principal constellations make up the zodiac and seven of them are now at least partly visible, stretching across the southern sky. The others are Libra, the scales, and Virgo, the virgin, west of Scorpio; and Pisces, the fishes, Aquarius, the water carrier, and

Capricornus, the horned goat, all to the east of Sagittarius.

In the northwest is the familiar Big Dipper, which is really part of Ursa Major, the great bear. In the Dipper's bowl, which is now at the bottom, are the two pointers whose direction, followed to the right, brings you to Polaris. This is the pole star, which stands almost directly over the North Pole of the earth. All the other stars seem to circle daily around this part of the sky.

## Arcturus in West

If you follow the curve of the Dipper's handle to the left you come to Arcturus, in Boötes, the herdsman, which stands in the west. Above it is Hercules, the strong man of mythology. Between Ursa Major and Hercules is Draco, the dragon, which winds snake-like around Ursa Minor, the little bear, in which Polaris stands.

To the right of the small bear are Cepheus and Cassiopeia, representing legendary king and queen of ancient Ethiopia. Next right is their daughter, Andromeda, and Pegasus, the winged horse. Four stars in this

region of the sky form the "great square," now resting on one corner.

Although only Saturn is visible in the evening skies in August, the other four naked eye planets appear in the early morning hours, and perform an intricate dance. On Aug. 1 Venus rises about two hours before sunrise, followed a few minutes later by Jupiter. As the coming dawn brightens the eastern sky, the two planets form a brilliant pair. Venus is brighter, of magnitude minus 3.3. Jupiter is about one-fourteenth as bright.

On Aug. 7 Venus passes closely south of Jupiter, and thereafter the latter will rise first, and will be visible above Venus. Venus will rise later and later from then on, nearer and nearer to sunrise, while Jupiter comes up earlier each night. In early October, Jupiter will rise at midnight.

Mercury, on the 16th, will be farthest west of the sun, and will rise less than half an hour after Venus. For a few days about this time you may be able to see it low in the east at dawn as a bright star—lower and to the left of Venus, and considerably fainter.

Mars also gets into the act. Venus

THE PLANETS IN AUGUST		DISTANCE	
		Aug. 1	Aug. 31
Mercury	Visible low in east just before sunrise at middle of month	57,000,000 miles	117,000,000 miles
Venus	Rises in east about two hours before sunrise	138,000,000	149,000,000
Mars	Near Venus but very faint (about one-hundredth as bright as Venus)	226,000,000	217,000,000
Jupiter	Rises in east about two hours before sunrise (about one-sixth as bright as Venus)	571,000,000	550,000,000
Saturn	Rises in east about two hours after sunset; visible for rest of night	828,000,000	801,000,000

goes past it, to the south, on Aug. 3, and it passes north of Jupiter on the 12th. However, Mars is now rather faint, only second magnitude, and will be difficult to see in the dawn's early light.

On Sunday, Aug. 14, the moon, in a narrow waning crescent, passes south of these four planets. It goes past Jupiter first, at about 4 a.m. (daylight time). Two hours after that it passes Mars and, later in the day, Venus and Mercury.

August is also the month for one of the most reliable displays of meteors or shooting stars—the Perseid shower. They are so named because they seem to radiate from the constellation of Perseus, which appears on the northern sky map below Cassiopeia in the northeast. Actually the meteors move in parallel paths, becoming visible when they encounter the earth's atmosphere and vanish in a streak of light.

The meteors will be most easily seen in the early morning, when Perseus is higher in the east. After midnight we are on the forward side of the earth as it revolves around the sun, so we meet the meteors head-on. In the evening we can only see those that are moving fast enough to catch up to us.

The Perseid display begins about July 25, and continues until Aug. 17.

with the maximum about Aug. 12. The moon, by that time, will not rise until well after midnight, so its glare will not interfere. If you watch the night sky for even a few minutes around the time of peak activity, you will probably see several bright meteor.

**Celestial Time Table for August**

AUG.	EDT	
1	5:06 a.m.	Moon
3	10:00 p.m.	Venus passes south of Mars
4	noon	Moon farthest, distance 252,200 miles
5	9:00 a.m.	Moon passes south of Saturn
7	1:00 p.m.	Venus passes south of Jupiter
9	8:56 a.m.	Moon in last quarter
12	early a.m.	Perseid meteors at height 1:00 a.m.
	1:00 a.m.	Mars passes north of Jupiter
14	4:00 a.m.	Moon passes north of Jupiter
	6:00 a.m.	Moon passes north of Mars
	4:00 p.m.	Moon passes north of Venus
	10:00 p.m.	Moon passes north of Mercury
16	3:00 a.m.	Mercury farthest west of sun
	7:48 a.m.	New moon
17	3:00 a.m.	Moon nearest, distance 222,600 miles
22	11:02 p.m.	Moon in first quarter
30	8:14 p.m.	Full moon
31	7:00 p.m.	Moon farthest, distance 252,500 miles

Subtract one hour for CDT, two hours for MDT, and three hours for PDT.

• Science News, 90:58 July 23, 1966

SPACE

# Mars Pictures Year Old

► THE FIRST CLOSE-UP photos of Mars, taken last year by Mariner 4, were a year old on July 14, and scientists still have more than three years to wait before they receive any more.

For two and a half months after it took its pictures, Mariner kept sending data of various kinds, until it finally got out of range of the huge antennas on earth that were listening to its every word. On May 21 of this year, the spacecraft began talking again.

But Mariner 4 may not be "alive" for more than another two birthdays.

A bottle that originally contained 3.22 pounds of nitrogen gas will run out some time in 1968. The gas is used in attitude control jets that enable the spacecraft's computers to keep it steady and pointed in the right direction. When the bottle is empty, Mariner will have no way of responding to instructions from its star-sensors, which use the stars to determine position just as did early seafarers.

The next close-ups of Mars will be taken late in 1969 by another Mariner spacecraft, which almost died before it even got to the drawing board. Tight budgeting had caused the mission to be cancelled in favor of one in 1971, but the earlier flight has been restored to the schedule. Actually, two spacecraft will be launched early in the year, though scientific payloads have not yet been selected.

Since Mariner 4, several new sources of photos have been added to the Outer Space Art Gallery: five Gemini spacecraft (5 through 9), two ESSA weather satellites and perhaps a secret or two from the Defense Department. And of course, Surveyor 1.

A trip to Venus will precede the next one to Mars. Launched early next year will be the spacecraft that would have backed up Mariner 4, had it not done so well. Previously, Mariner 2 flew within 21,600 miles of the planet.

• Science News, 90:59 July 23, 1966

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