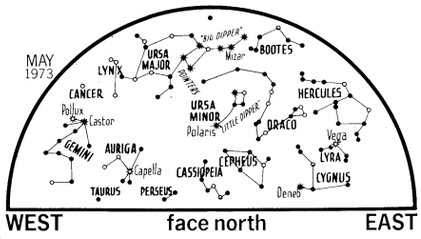
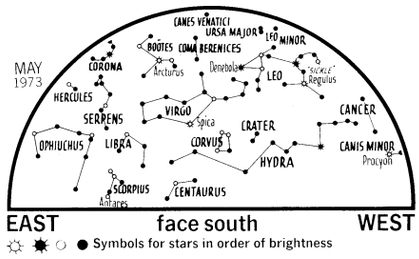
Detection of Uranus and Neptune

by James Stokley





☼ ✸ ○ ● Symbols for stars in order of brightness

Stars are the main display in the evening skies of May, for no bright planet appears, except early or late. Saturn sets just too soon to appear on our sky maps. It is in the constellation Taurus, of which one faint star remains on the map, low in the northwest.

Two more planets are in the May evening sky. One is Uranus, a little above and to the right of Spica (just to the right of the "O" in Virgo). It's about 5.7 on the astronomical scale of magnitudes. Since magnitude 6 is usually considered the faintest that can be seen with the naked eye under most favorable conditions, Uranus barely makes it.

It is not visible through the dust and glare in the sky near a large city. If you are out in the country on a dark night and the pollution is not too bad, you might be able to pick it up. It has a greenish hue with a steady light, different from the twinkling of a star.

The other planet is Neptune, low in the southeast in Scorpius. However, its magnitude is 7.7, about a sixth as bright as Uranus. There is no chance of seeing it with the naked eye, and it won't be easy even with binoculars.

William Herschel, a German-born musician and amateur astronomer who moved to England in 1757, discovered Uranus on March 13, 1781, from his home in Bath. He was "sweeping" the heavens with a telescope of his own construction, searching for objects of interest. He saw something which he immediately recognized was not a star, but he thought it was a comet. A year later an astronomer named A. J. Lexell calculated its path, showing it to be a planet, moving in an orbit beyond Saturn.

Herschel wanted to name it Georgium Sidus (George's star) in honor of the king, George III. Other astronomers proposed that it be called Herschel, and this name was used for a time in England. But later the name Uranus was adopted, after the sky-god of Greek mythology.

In a few years astronomers found that Uranus did not move exactly in accord with their predictions. By 1845 it had deviated by a distance equal to about one-fifteenth the apparent diameter of the moon.

By the force of gravitation every planet pulls on every other planet and these effects are considered in calculating how one moves. It seemed, therefore, that Uranus was also being pulled by still another planet that had not yet been discovered.

Independently two astronomers, John Couch Adams in England and Urbain Jean Joseph Leverrier in France, figured out where another planet would have to be in order to produce the observed movement of Uranus. Adams solved the problem first and sent his data to the Royal Observatory in London. But the Astronomer Royal, the head of that institution, was unimpressed and didn't even bother to look where Adams had said it would be.

Leverrier had better luck. He wrote to Johann Gottfried Galle at the Berlin Observatory, telling him to look at a certain position in the constellation Aquarius, where he would find the new planet.

Galle received the letter on Sept. 23, 1846. That night he and an associate pointed their telescope to that part of the sky. Within half an hour they found it, less than twice the moon's apparent diameter from the place that Leverrier had indicated. Following the practice of naming planets after Greek gods, Leverrier, on the advice of the French Bureau of Longitudes, chose Neptune, after the god of the oceans.

Jupiter, Saturn, Uranus and Neptune are sometimes called the "major" planets, because they are so much bigger than any of the others.

The accompanying maps show the heavens as they look about 11 p.m., local daylight saving time, on May 1; an hour earlier at midmonth and two hours earlier at the end. □

CELESTIAL TIMETABLE

May	EST	
2	4:55 pm	New moon
4	2:00 am	Moon nearest, distance 223,800 miles
5	4:00 am	Moon passes north of Saturn
9	8:07 am	Moon in first quarter
27	12:18 am	Full moon
19	10:00 am	Moon farthest, distance 252,300 miles
25	4:40 am	Moon in last quarter
27	9:00 am	Neptune opposite sun and nearest earth, distance 2,719 million miles