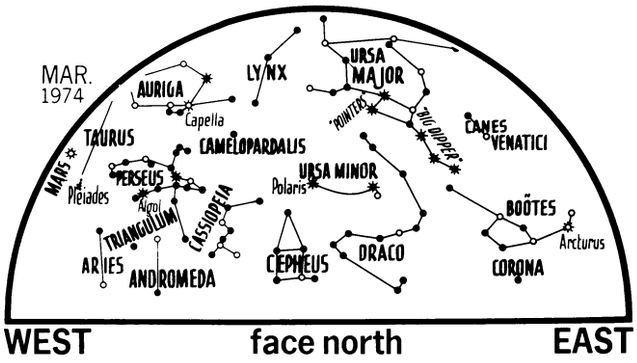

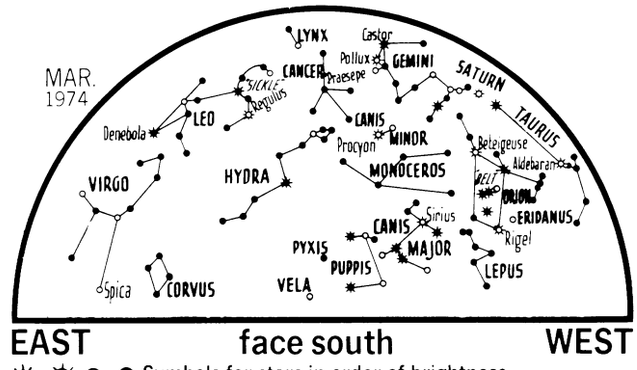

☼ ✹ ○ ● Symbols for stars in order of brightness

Saturn shines in western sky

by James Stokley

Saturn, shining brightly in the west in the constellation Taurus, is the March evening sky's most prominent planet. Also visible in the west, but lower, is Mars, about half as bright at the beginning of the month. During March its distance increases from 131 million to 158 million miles so it's steadily fading. At the month's end it will be about a third as bright as Saturn.

Sirius, in the southwest in Canis Major, is the brightest star. It appears, along with the other principal stars, on the accompanying maps. These depict the sky as it looks about 11:00 p.m., local daylight saving time, on March 1; an hour earlier on the 15th and two hours earlier on the 31st.

Spring begins in the Northern Hemisphere (and autumn in the Southern) on March 20 at 8:07 p.m., EDT.

In the upper part of Taurus just below Saturn (marked Z on the southern sky map) is the star Zeta Tauri. Zeta Tauri is third magnitude, about a fifteenth as bright as Saturn.

A little to the right of Zeta is one of the most interesting objects in the sky—unfortunately not visible to the naked eye. But if you had been around in 1054 A.D., you would have seen a brilliant star in this position. For several weeks it shone brightly enough to be seen in full daylight.

Now in this position a telescope of moderate size shows a faint patch of light of the eighth magnitude—about a hundredth as bright as Zeta. Bigger telescopes reveal a shape resembling a crab—hence it is known as the Crab Nebula.

In 1921 an American astronomer, John C. Duncan, while working at the Mt. Wilson Observatory in California, found that it was expanding. Working backwards he concluded that the expansion began with a stellar explosion about nine centuries earlier.

This was a supernova which is a violent explosion of a very old star. A younger star's energy is generated by a process similar to that of the hydrogen bomb: Nuclei of hydrogen atoms combine to form helium nuclei. Later in a star's career heavier atoms are used as fuel. Pressure of the continual outpouring of radiation maintains the size of the star, like the pressure of gas inside a balloon.

When the fuel supply at the star's core is finally exhausted radiation pressure ceases and the star collapses. The atomic nuclei, normally far from each other, are squeezed closely together. The star's diameter, formerly a million miles or more, is reduced to perhaps ten miles. A cubic inch of its material may have a mass of trillions of tons!

So much radiation is emitted that, for a time, it may become millions of times brighter than it was before it fades to obscurity. Although it collapses inward (an implosion rather than an explosion) the material rebounds outwards at high speed. This is about a thousand miles a second in the case of the Crab Nebula. Still glowing, this may be seen long afterwards as a cloud of expanding gases, such as that forming this nebula. Actually the collapse of the star occurred about 5,000 years before 1054. It took that long for its light to reach our planet.

Fourteen such supernovas have been recorded in our own stellar system, the Milky Way Galaxy, since the beginning of the Christian era. The last was in 1604. But there are millions of other galaxies, each containing many billions of stars, within reach of large telescopes. Astronomers have observed several hundred supernovas in some of these galaxies, since they first began to utilize photography in their work, nearly a century ago. □

CELESTIAL TIME TABLE

Mar.	EDT	
1	2:03 pm	Moon in first quarter
2	7:00 pm	Moon passes north of Saturn
6	2:00 am	Moon nearest, distance 225,530 miles
8	1:40 am	Algol (variable star in Perseus) at minimum brightness
	6:03 am	Full Moon
10	10:30 pm	Algol at minimum
15	3:15 pm	Moon in last quarter
17	10:00 pm	Moon farthest, distance 251,550 miles
20	8:07 pm	Sun directly over equator; spring begins in Northern Hemisphere
23	5:24 pm	New Moon
29	6:00 am	Moon passes south of Mars
30	2:00 am	Moon passes north of Saturn
	9:44 pm	Moon in first quarter
31	12:20 am	Algol at minimum