ASTRONOMY

Jupiter Shines in East

Four other planets can be seen during month. Six of the first-magnitude stars can also be seen. Milky Way consists of myriads of stars, faint because of their distance.

By JAMES STOKLEY

➤ SHINING HIGH in the eastern sky in the constellation of Aries, the ram, the planet Jupiter is the brightest of the stars or planets to be seen now through most of the night.

Actually, it is a couple of times fainter than Venus, which is in Libra, the scales, and is seen low in the southwest just after sunset as dusk is gathering. Since Venus goes below the horizon about an hour after the sun at the beginning of October, and nearly two hours afterward at the end, it disappears before twilight is entirely over.

Hence, unlike Jupiter, it cannot yet be seen shining brilliantly in a completely dark sky. A few months hence Venus will be in such a favorable position, and Jupiter will then have to take a secondary place.

The position of Jupiter is shown on the accompanying maps, which depict the appearance of the skies at about ten o'clock, your own kind of standard time, at the beginning of October; an hour earlier on the 15th; and two hours earlier on the 31st.

Libra sets before these times. So does most of Sagittarius, the archer, which is the present abode of Mars. This planet, however, may be seen earlier in the evening in this group.

First Magnitude Stars

Mars now is about as bright as a typical first-magnitude star, such as Altair, in Aquila, the eagle, visible in the west. The planet's distinctly reddish color should make it easy to identify.

As for the other planets, Mercury is now an "evening star," which means that it remains above the western horizon for a while after the sun has set. Even by the end of October, however, it will descend out of sight about three-quarters of an hour after sunset, and will be seen, if at all, against a fairly bright sky background.

In October, Saturn is a morning star, appearing in the east before sunrise. About the tenth it will rise with the sun, while by the end of the month, it will precede it by about an hour and a half, rising just as the morning twilight begins.

Vega, high in the west in Lyra, the lyre, is the brightest star of October evenings. In second place is Capella, in Auriga, the charioteer, which is seen toward the northeast. Altair is third, and next comes Aldebaran, in Taurus, the bull. This group is in the east, just to the right of Auriga.

Fifth place is taken by Fomalhaut, part of Piscis Austrinus, the southern fish. Directly south, it is now about as high as we ever see it from these latitudes. The last, and faintest, of the October evening's first-magnitude stars is Deneb, in Cygnus, the swan. This group shines high in the west, just above Lyra.

October is a good time of year to look at the Milky Way. This is the broad path of light that can be seen, when one is away from the glare of city lights, extending from Sagittarius, up through Aquila and Cygnus, and down through Cassiopeia, the chained princess (seen in the northeast and shaped like a letter M tilted to the right), and Auriga to the northeastern horizon.

Binoculars Show Beauty

Look at the Milky Way through a pair of binoculars and you will see, as Galileo discovered in 1610 when he looked at it through his first little telescope, that it is made up of myriads of faint stars that cannot be distinguished with the naked eye. Instead, their light combines to form a continuous glow. These stars are faint because of their great distance, for most of them are many times brighter than the sun.

Also in the Milky Way are dark regions. One of the most famous is in Cygnus, and is called the "coal-sack." This once was thought to be a "hole in the sky," a region devoid of stars, but now we know that it is a dust cloud that obscures the stars beyond.

All the stars that we can normally see, even through telescopes, are formed into a great system called the galaxy, which is shaped like a grindstone. Though displaced considerably from the center, we are within this grindstone of stars.

When we look toward the sides we see relatively few stars, but looking toward the edge there are a great many more, and this is the reason for the concentration in the Milky Way.

There is a great deal of dust in the galaxy; in fact, it has been estimated that there is about as much material between the stars as in the stars themselves. In addition to forming dark areas, where it is silhouetted against the starry background, dust also makes its presence known by a reddening of distant stars.

When the earth's atmosphere has in it great quantities of dust, the light of the setting sun is reddened as it passes through such material. The interstellar dust acts in a similar way, and causes a slight reddening of distant stars, proportional to their distances.

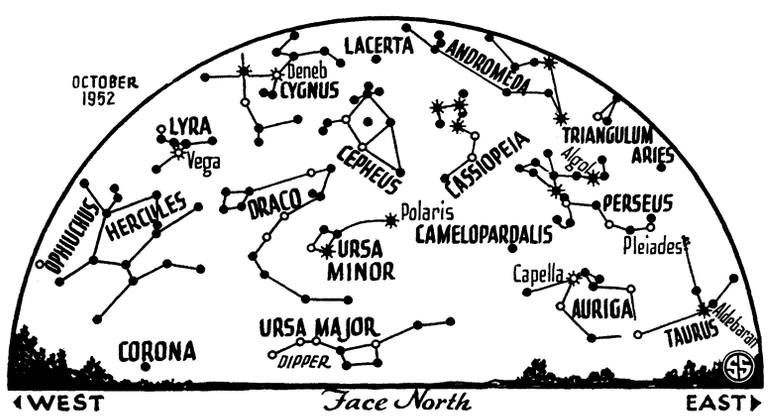
There are also clouds of gas between the stars of the galaxy. Although such gas is highly rarefied, far thinner in fact than in the highest vacuum we can get on earth, the distance that the light of a star has to travel means that it encounters vast numbers of gas molecules on its journey to us.

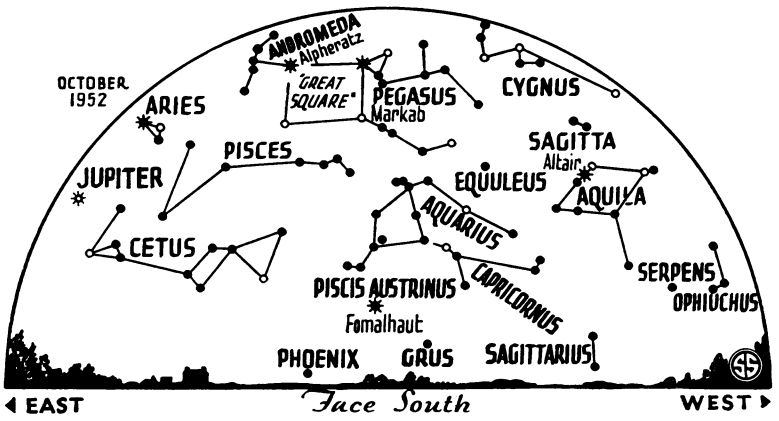
Analyzing star light through a spectroscope, we find that the colored spectrum is crossed by dark lines, each due to the absorption of a certain color, or wavelength, by gases in the star's atmosphere. Also the spectrum tells us about a star's motions. The lines are shifted to the red end of the spectrum if it is receding, and to the blue end if it is approaching the earth.

Gases in Interstellar Space

In 1904, in the spectrum of a star in Orion, astronomers found a line which is caused by a certain kind of calcium vapor. It seemed most peculiar, for such a line should not have appeared in a star of this particular type. A further peculiarity was that this calcium line did not shift as did the others in this star's spectrum.

The only explanation was that it did not result from gases in the star itself, but that the calcium which caused it was in space between the star and us. Since then other gases in interstellar space have been found.





Hydrogen seems to be by far the most abundant, but sodium, potassium, iron, titanium and cyanogen have also been found. This work is part of a long series of researches that clearly show that interstellar space is not nearly as empty as once thought to be.

Celestial Timetable for October

Oct.	EST	
1	4:26 a.m.	Algol, variable star in Perseus, at minimum brightness.
	8:00 a.m.	Moon nearest, distance 225,100 miles.
3	7:15 a.m.	Full moon.
4	1:14 a.m.	Algol at minimum.
6	5:18 a.m.	Moon passes Jupiter.
	10:03 p.m.	Algol at minimum.
10	2:33 p.m.	Moon in last quarter.
11	3:00 a.m.	Saturn in line with sun.
13	5:00 a.m.	Moon farthest, distance 251,500 miles.
18	5:42 p.m.	New moon.
21	6:07 a.m.	Algol at minimum.
	9:31 a.m.	Moon passes Venus.
24	2:56 a.m.	Algol at minimum.
	5:44 a.m.	Moon passes Mars.
26	11:44 p.m.	Algol at minimum.
29	1:00 a.m.	Moon nearest, distance 228,400 miles.
	8:33 p.m.	Algol at minimum.

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

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SANITATION

Purifying Drinking Water

➤ HIGH-PITCHED SOUND waves kill germs so effectively that they can be used to purify water and sterilize milk, Miss Lillian A. Russell of the Illinois State Water Supply told the American Chemical Society meeting in Atlantic City.

The sounds used are ultrasound of high intensity and a million vibrations per second. This is far beyond the range of the human ear, which is deaf to any frequency above about 16,000 cycles per second. Ultrasound is made by vibrating a quartz crystal in a high frequency electrical field.

Miss Russell predicted that instruments will be developed that will supply sound sterilization practically in water purification and in the dairy industry.

The waste from atomic furnaces could be used to purify water and sewage by treating them with radiations, Prof. Cecil G. Dunn, Massachusetts Institute of Technology, reported. About a day of exposure to a millicurie of cobalt such as used to treat cancer will sterilize contaminated water.

However, a mere ten seconds of exposure to irradiation from a Van de Graaff generator will do the same cleansing.

Drinking water, swimming pools, and even rivers and sewage could be made safe by such atomic radiations.

For use in mass sterilization of apparatus and material such as would be necessary in germ warfare attack, ethylene oxide can be used quickly and without damage from corrosion, Saul Kaye and Bernard F. Surkiewicz of the Chemical Corps Biological Laboratories, Camp Detrick, Md., reported. Whole rooms can be sealed with plastic films and used as sterilization chambers.

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MEDICINE

Acute Leukemia Studied With V.F.W. Grant

➤ TREATMENT OF more children with acute leukemia by chemotherapy will be speeded by a $15,000 research grant made to the Children's Hospital of the East Bay by the Ladies Auxiliary of the Veterans of Foreign Wars, Oakland, Calif.

Dr. Luigi Luzzatti, medical director, and Dr. William B. Chew plan to evaluate further the results of the use of folic acid antagonists, which have been demonstrated to be important in treating acute leukemia, a cancer-like disease of the blood.

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ENGINEERING

Machine to Reduce High Price of Eggs

➤ THE HIGH price of eggs may take a tumble, if engineering experiments now under way at the University of California at Los Angeles prove successful.

P. F. O'Brien, assistant engineer, is trying to develop a machine that will eliminate the specialized labor involved in candling or grading eggs.

"Much of the high cost of eggs these days is due to the amount of specialized labor involved in candling or grading eggs," Mr. O'Brien points out. "If a machine can be designed to do this automatically, eggs would be much cheaper."

One of the objectives of his research is the design of such a machine. The machine would be designed to examine the internal structure of the egg, which largely determines the egg's grade.

Another important aspect of the study is devising a method to detect Pseudomonos infection, which causes "sour eggs," particularly prevalent on the West Coast.

The infection may be detected in white eggs with ultraviolet light. However, it is extremely difficult to spot it in brown eggs due to the color of the shell. Mr. O'Brien is experimenting with a form of radiation that will cause only the infection to fluoresce.

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