

ASTRONOMY

No Planets in Evening

But there will be plenty of bright stars during November evenings. The "Great Square," high in the south, is a good group with which to find the fall constellations.

By JAMES STOKLEY

► WHILE NO PLANETS are easily visible through the evening in November, there are plenty of bright stars to repay a study of the skies; and if you happen to be around in the early morning hours, some planets come into view. On the accompanying maps are depicted the appearance of the heavens at about 10:00 p.m., your local brand of standard time, at the first of the month. In the middle of November they will look the same way an hour earlier.

A good group with which to start finding the autumn constellations is that marked "Great Square," high in the south, part of Pegasus, the winged horse. Extending from the upper left hand corner of the square directly overhead is Andromeda, the chained lady. Below and to the left of the square one sees Pisces, the fishes; and below this is Cetus, the whale. To the right of these figures is Aquarius, the water carrier, and below this another fish is found—Piscis Austrinus, the southern fish, with the bright star Fomalhaut.

Bright November Stars

The brightest stars of the November evening skies, however, are found in two groups, one to the east and the other to the west. Just above the eastern horizon Orion, the warrior, is coming into view. First magnitude Betelgeuse is to the north, and Rigel to the south, of the three stars in a vertical row that mark his belt. Above Orion we find Taurus, the bull, with brilliant Aldebaran, red in color. About the same height in the east, and farther to the left, is Auriga, the charioteer, with Capella. Below this is Gemini, the twins, with Pollux as the brightest star.

In the northwest shines the northern cross, part of Cygnus, the swan, and with Deneb, another star of the first magnitude, at the top of the cross. Below it is Lyra, the lyre, with Vega, and to the left you will find Aquila, the eagle, with Altair.

At the beginning of the month the

planet Venus will be too nearly in line with the sun to be visible, but by the end it will shine just above the southwestern horizon at sunset. During the later fall and winter it will become a most brilliant object in the western evening sky. Jupiter, which makes a close approach to Venus on Nov. 9, is also low in the southwest at sunset, and hard to locate, since it is fainter than Venus. Mercury is on the western side of the sun, so that it comes up in the east just before sunrise, and may be glimpsed at dawn low in the southeast.

Mars and Saturn

Mars and Saturn arise in the east about midnight, in the constellation of Leo, near the star Regulus. They are in that order from west to east and about equally spaced. The order will change during November, for on the 11th Mars passes within a degree to the north of Saturn, and on the 28th within two degrees of Regulus. The three objects can easily be identified by remembering that Saturn is the brightest, Regulus the faintest, while Mars is distinctly red in color.

On the night of Nov. 16 this same part of the sky—the constellation of Leo, the Lion—will be a center of interest for from it will seem to emerge the meteors of the Leonid shower. Actually these meteors, or shooting stars, are bits of cosmic dust, moving through

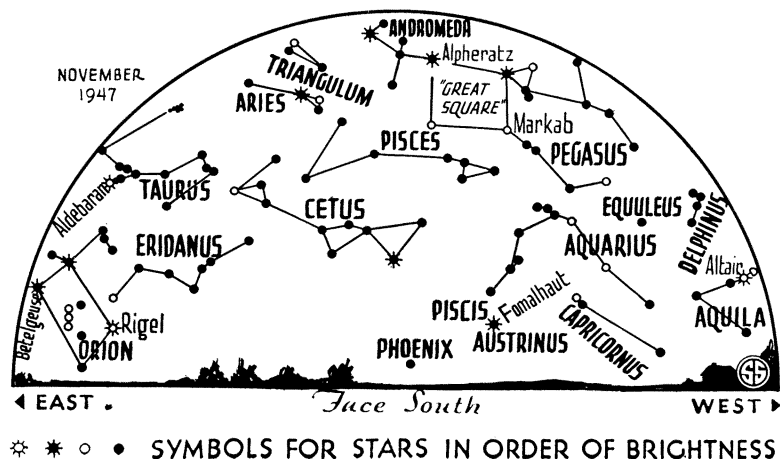
space in parallel paths. Like the tracks of a railroad, these seem to converge in the distance, towards Leo. More of these meteors will be seen after midnight than before, and perhaps one a minute will be visible when the shower is at its height. Of course, these are not stars at all, but tiny particles which enter the earth's atmosphere and disappear as they are burned up in a flash of light.

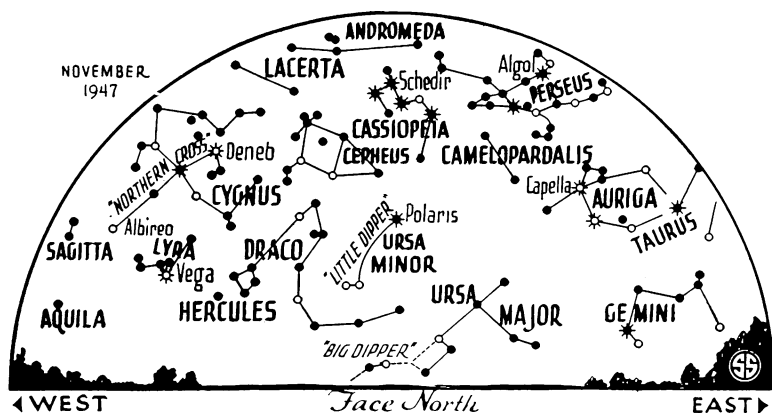
Eclipse of Sun

On Nov. 12 the second eclipse of the sun this year will occur, and unlike the first, on May 20, something of it will be seen in most of the United States. The earlier eclipse was of more scientific interest, however, for it was total. Then the moon's shadow swept across the earth along a track crossing South America, the Atlantic Ocean and Africa. Many scientists travelled to points along the path, and there the sun's disk was completely hidden by the moon, making possible many observations not feasible at other times.

The moon will be relatively farther away on eclipse day, Nov. 12, than it was in May, and it will look a little smaller—too small, in fact, to cover the sun completely. Thus there will not be a total eclipse even in places on the earth directly in line with the centers of the sun and moon. When the eclipse is at its height at these points, the dark disk of the moon will be visible with a ring of the sun's edge around it. Such an event is called an "annular" eclipse from the Latin word for a ring.

The narrow path along which the annular effect will be visible crosses the





Pacific Ocean to the coast of Peru and then ends in the jungle of Brazil. But over a much larger area one edge of the sun will be covered by the moon, and there a partial eclipse will occur.

The region of the partial eclipse covers the northern part of South America, except the extreme eastern part of Brazil; all of Central America; most of the United States and the western part of Canada. The only part of the United States where it will not be visible is that north of a curved line crossing Massachusetts, New York, Pennsylvania, Ohio, Indiana, Illinois and Wisconsin.

California will see the greatest eclipse, with about 40% of the solar diameter being covered in the region of San Diego. Farther north and east the eclipse will be less. At Denver, for example, the coverage will be only 14%. At Atlanta it will be 10%, and at Washington 4%. New York will get only 2% and Chicago 1%, hardly enough to be noted. Watching the sun through some protective screen, such as an exposed piece of

photographic film, possibly a narrow bite will be noted in the sun's edge. The time of the maximum at New York will be 10:48 a.m., EST, and at Chicago 9:21 a.m., CST.

Time Table for November

Nov.	EST	
3	9:00 a.m.	Moon nearest, 229,400 miles
5	2:43 a.m.	Algol (variable star in Perseus) at minimum brightness
	12:03 p.m.	Moon in last quarter
6	9:37 p.m.	Moon passes Mars
7	1:40 a.m.	Moon passes Saturn
9	11:32 p.m.	Algol at minimum
10	9:00 a.m.	Venus passes Jupiter
11	8:20 p.m.	Algol at minimum
12	1:00 p.m.	Mars passes Saturn
	3:01 p.m.	New moon; annular eclipse of sun is visible in Pacific Ocean, partial eclipse visible over most of North America
13	7:39 p.m.	Moon passes Jupiter
14	5:25 a.m.	Moon passes Venus
16	Early morning	Meteors of Leonid shower visible
18	6:00 p.m.	Moon farthest; distance 251,500 miles
20	4:44 p.m.	Moon in first quarter
25	4:25 a.m.	Algol at minimum
28	1:14 a.m.	Algol at minimum
	3:45 a.m.	Full moon
30	1:00 p.m.	Moon nearest; 226,100 miles
	10:03 p.m.	Algol at minimum

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

Science News Letter, October 25, 1947

Another manufacturer will have a cigarette-pack-sized radio receiver using printed circuits on the market "in about a month," it was learned at the symposium. A hearing aid with light, compact printed circuits was also shown to the group of scientists.

New uses for printed wire in electronic circuits will range from radar to toys and games, Dr. Clelio Brunetti, engineer at the National Bureau of Standards predicted. Dr. Brunetti demonstrated his own small, printed-wire radios. He has built a transmitter in a lipstick and a radio receiver the size of a calling card.

A military leader, R. J. Framme, Wright Field, Ohio, engineer and member of the military aeronautical board which sponsored the meeting, declared that printed circuits and other rugged miniature parts are "the only thing" that can be used to get the small size and light weight needed for electronic assemblies on guided missiles, automatic aircraft and other military equipment using electronics.

Science News Letter, October 25, 1947

A tall tree close to a house usually, but not always, protects the building from lightning.



SPEEDOMAX Saves Time; Records Data Accurately

At Univ. of Minnesota, a Speedomax records skin temperature of a student eating ice-cream during experiments to determine the effect of food temperature on blood flow. The instrument automatically collects data at six test points every half minute; requires none of the researcher's attention during the course of the test. Experimenters can be supplied with faster or slower Recorders. Write for catalogs, or consult an L&N engineer for specific information.

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ELECTRONICS

Printed Circuit Radios

Eleven-ounce two-way radios from which you can talk for a distance of 10 miles, to be offered public with private frequencies within the 460-470 megacycle range.

► ELEVEN-OUNCE two-way radio with which you can talk to your office or your home from a distance of up to ten miles is ready to go on sale as soon as the Federal Communications Commission sets up a licensing system.

A. Gross, president of Gross Electronics, Inc., Cleveland, showed his new instrument at a symposium in Washington on printed circuits. Flat, "printed" wires and other miniature

parts make possible the new light-weight, civilian "walkie-talkie." Complete with batteries and antenna, the two-way radio is carried in a leather case in the way you carry your camera. Price of the new transmitter and receiver will be "less than \$200 a pair."

They will be sold in pairs which are tuned to their own private frequencies, within the 460-470 megacycle range allotted to personal radios by the FCC. Each set will be licensed by the FCC.