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Coming Astronomical Events

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COMING ASTRONOMICAL EVENTS

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Jupiter

This fall skies will be dominated by the planet Jupiter. During October and November Jupiter will be rising near sunset and will be visible nearly all night. An interesting activity for beginning students of astronomy is to identify Jupiter's four brightest moons. We know now that Jupiter has thirteen moons but only four are easily seen with small telescopes. (The thirteenth was discovered in September, 1974, by Charles Kowal of Mount Polamar Observatory.) The first four moons of Jupiter were discovered by Galileo in what was one of the first telescopic discoveries ever made by man. Hence, they are frequently referred to as the Galilean moons.

The first look at Jupiter through a small telescope usually produces a feeling of amazement, but beyond that the beginning student needs encouragement to pursue a project of depth involving this planet. One fairly simple project involves being able to identify and plot the positions of the four Galilean moons.

The pictures shown here (Fig. 1 and Fig. 2) were taken by the author at the UNI Observatory during November of 1973. They were taken about one hour apart thru an 8-inch Celestron telescope. Notice the small but perceptible changes in the location of the satellites.

Reprinted in Figures 3 and 4 are diagrams from the *American Ephemeris and Nautical Almanac* showing the location of the four Galilean moons during November of 1973 and November 1975. Figure 3 is shown to facilitate the identification of the moons on the photographs. The reader is invited to guess the exact date of the photographs and to identify which moons are which. The Roman numerals refer to the following moons: I=Io; II = Europa; III = Ganymede; and IV = Callisto.

If a student has access to a small telescope or a good set of binoculars, it is possible to observe and plot the positions of these moons and to make a rough estimate of their periods.

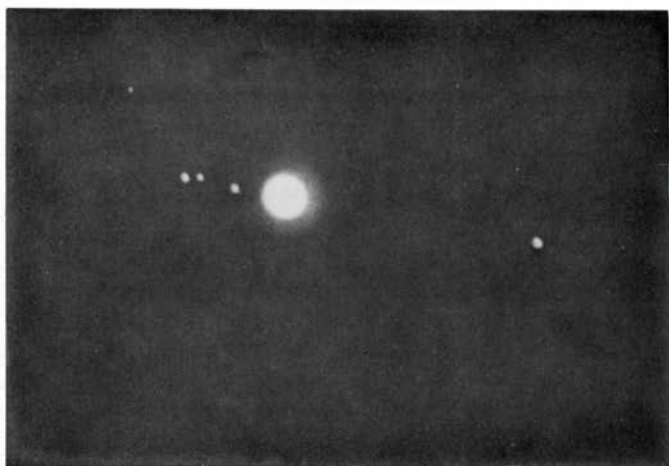


Fig. 1.

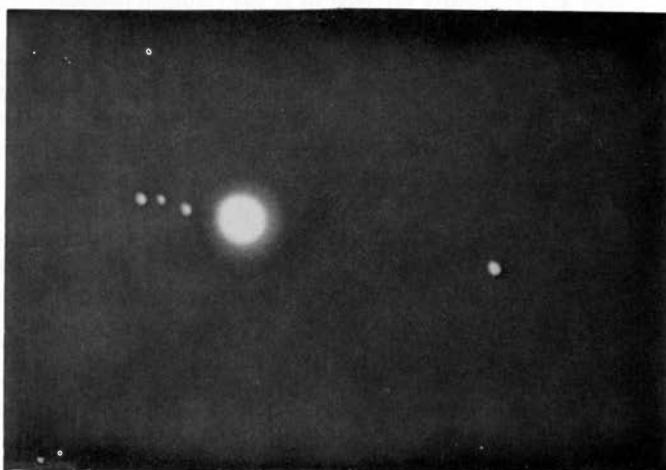


Fig. 2.

Photographs of Jupiter taken at the University of Northern Iowa during November, 1973, with an 8-inch Celestron Telescope, prime focus, Tri-X film, 1 sec. exp.

SATELLITES OF JUPITER, 1973
 CONFIGURATIONS OF SATELLITES I-IV FOR NOVEMBER
 UNIVERSAL TIME

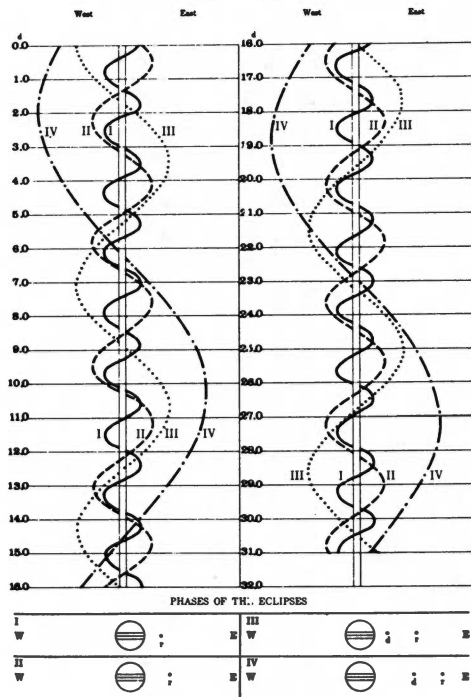


Fig. 3.

SATELLITES OF JUPITER, 1975
 CONFIGURATIONS OF SATELLITES I-IV FOR NOVEMBER
 UNIVERSAL TIME

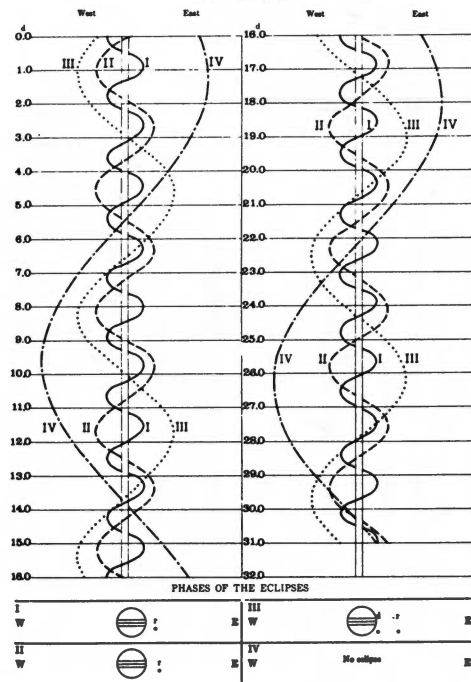


Fig. 4.

One should begin observing shortly after the planet rises, recording the exact time of the observation and making a sketch of the moons' positions relative to the planet. Continue observing all night at about 2-hour intervals while recording observing times and positions. Begin the observations the next evening and continue the process. It will require some imagination and diligence to recognize the same satellites in different positions on succeeding nights, but it is possible. The periods of these moons are in Table 1.

TABLE 1

Satellite	Period		
	<i>days</i>	<i>hours</i>	<i>minutes</i>
Io	1	18	28
Europa	3	13	14
Ganymede	7	03	43
Callisto	16	16	32

November Lunar Eclipse

There will be a total lunar eclipse on November 18, but unlike the earlier eclipse of May 24-25 it will not be visible over all of the United States. During the November eclipse, the moon will enter the earth's umbral shadow at 2:39 p.m. CST and become total at 4:03 p.m. CST, but the moon will not rise until about 4:20 p.m. CST.

Hence, the moon will rise already eclipsed (that in itself a fairly unusual event) and the totality will end at 4:44 p.m. CST shortly after sunset. The moon will not leave the umbra until 6:08 p.m. CST permitting viewers a good view of the end of the eclipse since by then the sky will be almost dark enough to see even the dim stars.

Editorial note: The diagrams of the configurations of satellites I-IV of Jupiter were reprinted with the permission of the Director of the U.S. Nautical Almanac Office of the U.S. Naval Observatory.