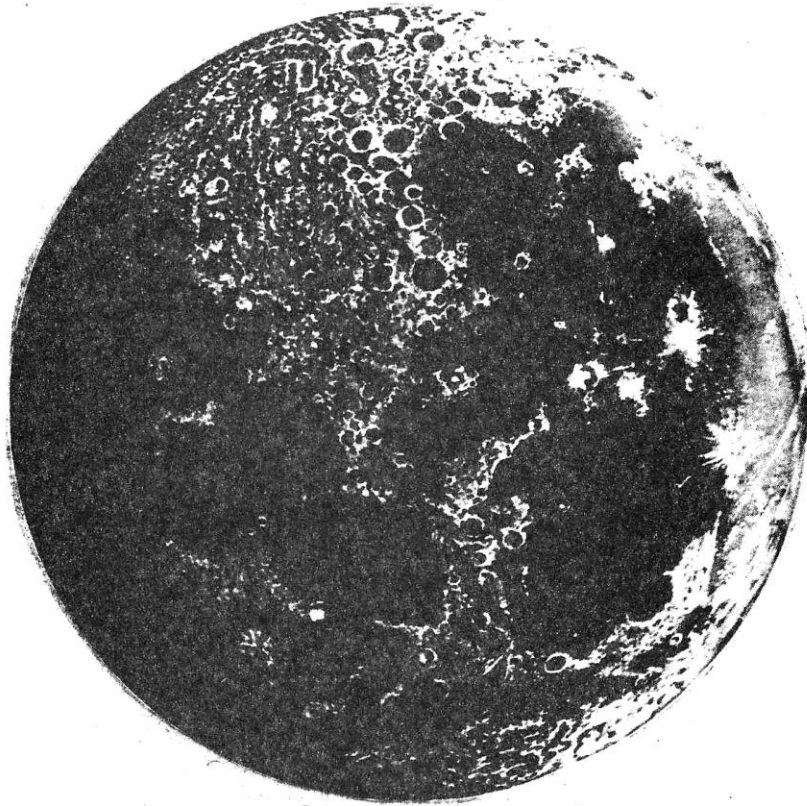


The
WASP



LUNAR ECLIPSE
MAY
24-25

JOURNAL of the WARREN ASTRONOMICAL
SOCIETY

JUNE
~~MAY~~ 1975

The Warren Astronomical Society is a local, nonprofit organization of amateur astronomers. Membership is open to all interested persons. Annual dues are as follows: \$2.00 for Student (K through college) Membership, \$4 for General Membership, and \$5.00 for a Family Membership. Add \$5.00 for a one year subscription to Sky and Telescope magazine. General meetings are held on the third Thursday of every month at Macomb County Community College (South Campus on Twelve Mile Road near Schoenherr in Warren) in room 311 of "B" building, at 8 p.m.

The Warren Astronomical Society Paper (W.A.S.P.) is published monthly, by and for the members of the Warren Astronomical Society. Subscriptions are free to all Warren Astronomical Society members. Personal advertisements by Warren Astronomical Society members are also free. Non-member subscriptions and advertisements are available upon arrangement with any of the editors of the W.A.S.P. Contributions, literary or otherwise, are always welcome. Contributions to the W.A.S.P. should be submitted to either of the editors listed below.

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	Michigan, 48077	Michigan, 48026
	268-9337	791-8752

The editors of the W.A.S.P. will exchange copies of this publication with other club publications on an even exchange basis. If your club would like to participate in such an exchange, please contact one of the above listed editors. The Warren Astronomical Society maintains correspondence, sometimes intermittent, with the following organizations:

THE ADAMS ASTRONOMICAL SOCIETY

THE ASTRONOMICAL LEAGUE

THE DETROIT ASTRONOMICAL SOCIETY

THE DETROIT OBSERVATIONAL AND ASTROPHOTOGRAPHIC ASSOCIATION

THE FORT WAYNE ASTRONOMICAL SOCIETY

THE GRAND RAPIDS AMATEUR ASTRONOMICAL ASSOCIATION

THE KALAMAZOO ASTRONOMICAL SOCIETY

THE MIAMI VALLEY ASTRONOMICAL SOCIETY

THE OLGELTHORPE ASTRONOMICAL SOCIETY

THE OLYMPIC ASTRONOMICAL SOCIETY

THE ORANGE COUNTY ASTRONOMICAL SOCIETY

Other organizations are invited to join this list.

THIS MONTH'S COVER BY: Frank McCullough

JUNE	EVENT
1	Last Quarter Moon.
5	Messier Club meeting at 8 p.m., contact Frank McCullough, 791-8752, for details.
9	New Moon.
12	Astrophotography Meeting at 8 p.m., contact Larry Kalinowski, 776-9720, for details.
13-14	Annual Apollo Rendezvous in Dayton, Ohio, see last month's W.A.S.P. for details.
16	First Quarter Moon. Soviet cosmonaut Valentina Tereshkova becomes the first woman sent into space in 1963.
19	Warren Astronomical Society Monthly general meeting at 8 p.m., at Macomb County Community College (South Campus on Twelve Mile Road near Schoenherr in Warren) in room B 311. Bring a friend!
21	Greek astronomer Eratosthenes estimates the circumference of the earth from measurements taken at Alexandria (c. 240 B.C.)
22	Summer Solstice (Summer Begins!)
23	Full Moon.
29	American astronomer George Ellery Hale born in 1868 (invented spectro-heliograph).

IN MEMORIAM

On April 23rd, the Warren Astronomical Society lost one of its dearest friends and members, William Schultz, Jr. Mr. Schultz, 70, died Wednesday morning in St. Joseph Hospital in Pontiac after an operation for an aortal aneurysm.

Mr. Schultz, after his graduation with a bachelor of electrical engineering degree from the University of Michigan in 1930, joined the Cranbrook School for boys as a general science teacher. He served as chairman of the science department from 1938, when he received his master's in education from U-M, until his retirement in 1973.

In 1945 he became associate in astronomical education at the Cranbrook Institute of Science, where he was instrumental in the local popularization of astronomy. Recently, he supervised the installation of the new Spitz 512 projector in the institute's McMath planetarium, and the construction of a new planetarium in Rodger's City, Michigan (his home town) to house Cranbrook's old Spitz A-I. . In 1973, he became coordinator of the Cranbrook Institute of Science planetarium and observatory.

Mr. Schultz was a former president of the Detroit Astronomical Society and a member of the Catalpa Amateur Radio Society, the Greater Detroit Chrysanthemum Society, the Michigan Mineralogical Society as well as the Warren Astronomical Society.

He is survived by his wife, Dorothy K., three sons, Richard F., Robert W. and David P., three brothers, one sister and six grandchildren.

By his own request, Mr. Schultz's body was given to the University of Michigan Medical School. Tributes maybe made to any of the Cranbrook Institutions, including the Cranbrook Institute of Science.

Only two months ago Mr. Schultz spoke at the Warren Astronomical Society's monthly meeting, on astronomical education. Truly, the Warren Astronomical Society has lost a good friend.

CELESTIAL SHOWPIECES - Something to work for!

by Carl L. Noble

My interest in getting more beginners into the area of Astronomy again finds me at the typewriter to provide a piece of sheer superb literary work!

In the world of the Amateur Astronomer there is one sect that I would like to belong to - that being the members of the "Celestial Showpiece Club", better known as those Astronomers who have cataloged over 100+ of the Messier Objects. The different Objects have always interested me but never did I ever dream that I could have been able to see anyone of them. I always thought that only the 200 inch could only see these beautiful galactic clusters, globular clusters, Nebulae, or Galaxies. I have, at present 2 Messier Objects under my belt! I hope to have more than 70 of them by this time next year. It can be done, it is one of the many things that makes Amateur Astronomy so exciting.

Rule no. 1 is "Don't get upset and quit!" Anything worth something must be worked at. Finding these inconspicuous or prominent celestial showpieces is quite a task.

Rule no. 2 is "Ask the experts", meaning quite simply, the members of the Warren Astronomical Society. If you have any problems, someone in this group should be able to help.

Try to get a good atlas or star map, the information contained is helpful. It is also helpful to get the terms sorted out, so you will know exactly what you are looking for. Here are a few "definitions":

1. OPEN CLUSTERS: The open clusters are concentrations of stars which appear as loosely arranged groups. They have no particular pattern, but are a distinct unit within the surrounding stars. Because they all appear within our own galaxy they are known as GALACTIC CLUSTERS. (Pleiades and Hyades are two examples.)
2. GLOBULAR CLUSTERS: The globular clusters are closely packed, ball-shaped groups of stars. Unlike the open clusters, this group is made up of scores or hundreds of thousands of stars. (M13; M5, are two examples)
3. NEBULAE: There are two main groups here: 1.) Planetary Nebulae and 2.) Diffuse Nebulae. Both are basically large clouds of glowing gas. The Planetary Nebula seems to have come from an exploding star, thus it has a "ring" like effect. The Diffuse Nebula is characterized by a large "cloud" like effect, brightly glowing in the darkness of space. (M1, M27, M42, etc. are some examples.)
4. EXTRAGALACTIC SHOWPIECES – THE GALAXIES - What can be said when one views another island of stars, a galaxy? It really is a strange feeling you get inside when M51 comes into view of your eyepiece! Even a 3 inch to an 8 inch will give you a fairly good view. Don't let a lack of equipment stop you from finding some of these most beautiful objects in Creation. (Examples of these are, M51, M31, M101, etc.)

To the beginner I say, "Don't give up!" Even the dim Messier Objects can be seen with good seeing conditions. (The middle of Warren is not so hot even for the bright ones!) Don't get a feeling of hopelessness if you only have even a 2.25 Inch 'Scope; you can still see some of these 'objects. The most important thing to remember is to try.

See how many of these objects you can get in a period of only one year. Then you may start to see that there are many more things to see in the night skies than just the moon, and the planets!

HAPPY HUNTING!



"I may not be wealthy or goodlooking, but I do know where M1 through M101 is!"

A SANILAC SUNRISE

by

Kenneth Wilson

It had been a good night. I had gotten three guided exposures of the dark Port Sanilac sky. But now the dawn's blue twilight had even smothered out the fires of the first magnitude stars. Sunrise was coming and I sat waiting for it by the shore of Lake Huron, like some strange hunter waiting for his awesome prey. My weapon was a 60mm f/20 refractor strapped to a six-inch reflector mount. It had worked well before. I checked the focus of the camera on the running lights of a freighter, slowly cruising up the lake. Wouldn't it be great to get one of those silhouetted against the rising sun? But that was like asking for an unclouded winter night in Michigan. Fat Chance! If I only got a good sunrise sequence on film, it would be worth it.

Pete Kwentus and Garry Boyd had left for home two hours before, nursing their cold feet, and all was quiet save for the waves brushing on the beach and the chatter of the local birds whose building crescendo of song would soon reach a climax at the sight of the sun's first warming rays. A small flock of mallards circled the cloudless sky and landed on the cold water. I studied the hazy horizon, trying to guess the exact azimuth of the sun's first appearance.

And then it started.

First a thin orange line materialized somewhere between the haze and, the watery horizon. It grew fatter as I centered the makeshift telephoto and refocused. The line lasted longer than expected, so I clicked off one frame of film on it. Then the round upper limb of the sun finally poked its orange head into view. Swiftly it grew taller and taller, igniting the surrounding haze into an atmospheric pyre. The intense solar disc began to contort itself into the shape of an inverted thimble rather than the more frequent fishbowl and mushroom forms. Now the distorted disc was two-thirds exposed. Suddenly I noticed that the upper limb had grown a thin, green annulus. A tangential portion of the annulus broke off into an ever-narrowing, emerald layer! THE FAMOUS GREEN FLASH! It was just like the all-to-few photographs that I'd seen: Snap, another picture. By this time, the entire sun was up with an additional annulus of crimson fringing the lower limb! Like its green counterpart, it too fractured into shrinking layers! THE EVEN RARER RED FLASH!! In the end, there had been at least three separate green flashes and two red ones. I said a silent prayer as I rewound the film in the camera, hoping that the exposures and focus had been correct.

I packed up the rest of my equipment and tried to burn up the adrenaline that was racing through my veins. It had been the most beautiful sunrise that I had ever seen. Now, if those slides only come out.

THE GREEN FLASH

The green flash, as the phenomenon is called, is not easy to see from most places. People who have heard of it but looked for it in vain tend to dismiss it as a fantasy. Many who have seen it, including astronomers and physicists have considered it an optical illusion.

Many observers have seen the green flash and speculated about its cause. Most commonly they have described it as thin green bands visible for a fraction of a second at or just above the top edge of the sun as it sinks out of sight. On rare occasions it appears while the whole disk of the sun is still above the horizon, and then there may be a red flash at the bottom of the disk as well as a green or blue one at the top. The flash is about as common at sunrise as at sunset.

Normally the flash is extremely narrow. From top to bottom it covers only about 10 seconds of arc.

To see the flash with the naked eye requires a sharp horizon and a sky free from haze-conditions most likely to be found in deserts or on mountains, or over water.

What does produce the phenomenon? The answer lies in the laws of physics. When light from the sun enters the earth's atmosphere it is slowed down, and therefore bent or refracted, just as when it passes through a glass prism. The amount of refraction depends on the wavelength of the lights the shorter waves being bent more than the longer ones. Thus the white sunlight is spread out or dispersed in to a spectrum, with the longest (red) wavelengths at one end and the shortest (violet) at the other. The lower the sun, the greater the thickness of the air through which its light must pass before reaching the eye of an observer. Hence the dispersion is greatest at sunset and sunrise.

Because the shorter waves are bent more sharply, they strike the eye at a steeper angle and appear to be coming from a point higher in the sky than the longer ones. Thus the spectrum extends from violet at the top to red at the bottom. As long as a fair portion of the sun's disk is visible, light rays from its various parts overlap, and one cannot see the spectrum. (Sometimes a green or blue rim does appear at the top of the disk and a red rim at the bottom.) When the sun sinks below the horizon, the colors of the spectrum disappear one by one, the lowest red rays first, then the orange, yellow, green and so on.

Why, then, do we not see an orderly change of color instead of an abrupt flash of green? The reason is that the atmosphere filters out the other colors. In addition to dispersing light, the air also absorbs and scatters it. Absorption due mainly to water vapor, oxygen, and ozone, affects chiefly the orange and yellow light.

Scattering is stronger for short wavelengths. (Preferential scattering of blue light accounts for the color of the sky.) Thus when the red rays have sunk below the horizon, the orange and yellow are attenuated by the thick layer of air through which they are traveling toward our eyes. The blue and violet light is largely scattered away. The color least affected is green, and this is what reaches us.

-D. J. K. O'Connell, S. J.
"Scientific American"
January, 1960
P. 112-122

See also: The Nature of Light and Color in the Open Air, by M. Minnaert. p. 58-63

[illegible]

OBSERVATIONAL ASTRONOMY

By

Frank McCullough

LUNAR ECLIPSE

May
24th - 25th

Well folks, get those cameras and eyeballs ready, because in a little over a week you will witness (barring clouds) a total lunar eclipse. During totality, the colors to the naked eye might appear anywhere from red, copper, brown, blue, gray, or invisibility.

You say you don't have a telescope? Well, if you own a pair of binoculars or can obtain a pair, you will be sitting pretty. Some of the most breathtaking views can be obtained with this instrument and both eyes are put into action as God intended them to be.

Things to look for! You may try your skill at penumbral contact and progression. Contact will begin at 10:59 p.m. (E.S.T.) (May 24) giving you one hour and 1 minutes of penumbral observing.

Umbral contact occurs at 12:00 (midnight) - watch for that first bite out of the moon, Due to the brightness of the moon, color most likely will not be visually available at this time. Keep watching though, because during that one hour and three minutes of umbral shading leading into totality the color will become evident if it is to show color.

Totality begins at 1:03 a.m., (E.S.T.) (May 25) and will last an hour and a half, ending at 2:33 a.m.

For those who do not suffer from lack of sleep or fatigue, you can watch the uncovering of the moon for the next two hours and three minutes.

Astrophotographers

Since this can be quite a colorful event I ask, why use black and white film? Here are a few suggestions for types of slide film to use on the eclipse:

(160 ASA) High Speed Ektachrome is a very popular color film, it is fast, captures color fairly accurately, and yields good definition, also can give a nice sky background.

(80 ASA) Ektachrome X -A good film, not as grainy as H.S.E. but has a tendency to yield a greenish appearance, especially on the background.

(64 ASA) Kodachrome X - Slow film but low grain, good definition, very nice color and terrific background, just make sure if you use a slow film through your telescope for the low brightness umbral shadowing that your clock drive will allow you to record on film the moon's umbra for 40 to 60 seconds if not longer. Make sure also your telescope is sturdy. A shot of the bright moon at that low film speed may yield you nothing but blurry pictures.

OBSERVATIONAL ASTRONOMY (Cont.)

(25 ASA) Kodachrome - Super slow, super fine grain, not advisable unless you consider twice as much what has been mentioned above for Kodachrome X.

(64)ASA) GAF 64 - If there is a choice between this film and Kodachrome X, my choice would be to go Kodachrome, but you may find GAF 64 to your liking for it appears that all GAF films are on the contrasty side, and may be more striking and not as soft as Kodak films.

GAF 200 - Fast with good color balance, it may, on longer exposures, tend to go a little blue, but I see no problem for any exposures used on the eclipse. Grain is not too objectionable and could be comparable with H.S.E.

GAF 500 - Too fast, too grainy, and on short exposures yields in most cases an autumn brown background. May be interesting on umbral shots or during totality.

Only thing I can add is a film of 80 ASA to 200 may be the best film to consider, especially totality since most amateurs have only the basic clock drive to track the moon with and will want to try to record the umbra as fast as they can before the blurs set in. People with small telephotos and 50mm lenses feel free to step down to a slower film for your faster systems.

The Warren Astronomical Society will be hosting an eclipse party at Macomb College, for details, call:

791-8752

771-3283

776-9720



Penumbra
BEGINS



12:00
UMBRA



1:03 A.M.
TOTALITY

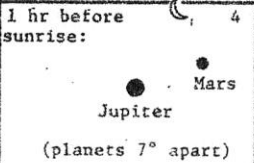
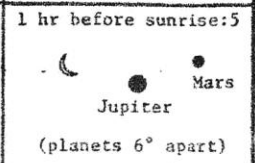
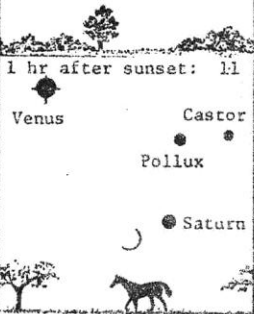
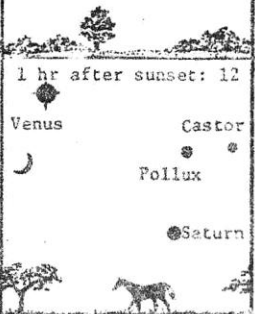
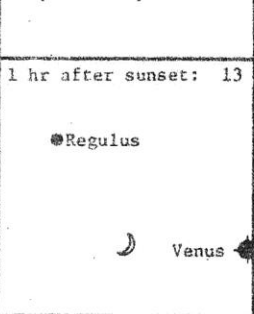
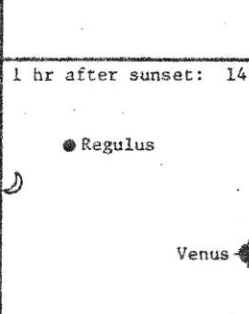
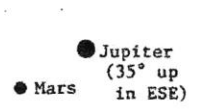
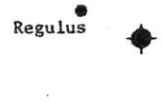


2:33 A.M.
TOTALITY
ENDS



SKY CALENDAR JUNE 1975

Information for helping teachers and students observe the sky

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
<div>1</div> <p>Moon, near Last Quarter, is about 90° west of sun in morning sky. For positions of Venus and Saturn in evening sky see this month's map.</p>	<div>2</div> <p>This evening Venus lines up with Castor and Pollux and is 5 1/2° to the left of Pollux. Saturn 10° lower right of Venus.</p>	<div>3</div> <p>Look at Saturn with binoculars. Note faint star nearly 1° to upper left of Saturn. Watch star and planet next 7 days (see June 10).</p>	<div>4</div> <p>1 hr before sunrise:</p> <div></div> <p>(planets 7° apart)</p>	<div>5</div> <p>1 hr before sunrise:</p> <div></div> <p>(planets 6° apart)</p>	<div>6</div> <p>Arcturus passes due south near end of evening twilight. "Follow the arc (of the Big Dipper's handle) to Arcturus, and drive a spike to Spica."</p>	<div>7</div> <p>Last chance to see moon easily until June 11. Look low ENE 1 hour before sunrise. Mars and Jupiter about 5° apart this morning.</p>
<div>8</div> <p>When sky has darkened, look about 4° upper left of Venus for the Beehive Cluster in Cancer. Use binoculars. Venus very close to cluster June 12.</p>	<div>9</div> <p>New Moon, not visible. Moon sets with sun, and dark side is toward us. --- Capella very low NW to NNW 1 hr after sunset.</p>	<div>10</div> <p>Tonight Saturn is one-tenth of a degree north of 3.5-magnitude Delta in Gemini. Use binoculars to see star.</p>	<div>11</div> <p>1 hr after sunset:</p> <div></div>	<div>12</div> <p>1 hr after sunset:</p> <div></div>	<div>13</div> <p>1 hr after sunset:</p> <div></div>	<div>14</div> <p>1 hr after sunset:</p> <div></div>
<div>15</div> <p>This month's map represents the sky about 1 hr after sunset tonight. See map for tonight's positions of Venus (20° lower right of Regulus) and Saturn (8° from Pollux).</p>	<div>16</div> <p>Mars and Jupiter appear closest this morning, only 1/2° apart. Pair rises in E 3 hrs before sunup and is best 1 hr before sunup. Evening: Moon, near First Quarter, about 90° east of sun at sunset.</p>	<div>17</div> <p>Bright star near moon tonight, to the east of it, is Spica. By tomorrow night moon will have moved 14° to the east of tonight's position. Spica will then be to west of moon.</p>	<div>18</div> <p>Venus reaches greatest elongation (maximum angular distance from sun at this apparition, 45°). Through telescope immediately after sunset, Venus looks like tiny half moon.</p>	<div>19</div> <p>Altair now rises at about sunset. As sky darkens, use this month's map to locate Vega, Deneb, and Altair in eastern sky. They form the Summer Triangle, so named because it is visible all night in early summer.</p>	<div>20</div> <p>Regulus 15° upper left of Venus. Watch Venus approach Regulus until July 8. Saturn now sets only 1 1/4 hrs after sun and is difficult to observe. Saturn behind sun July 15.</p>	<div>21</div> <p>Sun enters Gemini (Castor and Pollux disappear near end of June). Summer Solstice: Sun rises and sets farthest north. Highest midday sun of year. Evening: Red Antares south of moon.</p>
<div>22</div> <p>Venus is nearing the end of its reign as the "evening star". In 7 weeks it will set only 1/2 hr after the sun and be difficult to see. Watch for changes thru telescope and binoculars until then.</p>	<div>23</div> <p>Full Moon rises in SE sky as sun sets in NW. Moon in Sagittarius, halfway around zodiac from sun's place. Bright moon makes Sagittarius hard to see. Wait a few days.</p>	<div>24</div> <p>Moon rises about 40 min after sunset (as seen from latitude 40° north). Note moon's reddish color and apparently large size as it first appears.</p>	<div>25</div> <p>Moon rises about 1 hour and 20 minutes after sunset, well before twilight ends. Notice that the moon no longer appears full to the unaided eye.</p>	<div>26</div> <p>Moon rises about 1 hour and 50 minutes after sunset, shortly before the end of evening twilight. Moon now remains visible for several hrs after sunrise.</p>	<div>27</div> <p>Beginning tonight the moon rises after the end of evening twilight. For part of the evening the sky is dark, good for viewing the Milky Way.</p>	<div>28</div> <p>Next month's map represents the sky about 2 hrs after sunset tonight. Use binoculars to look for star clusters and nebulae in Scorpius and Sagittarius.</p>
<div>29</div> <p>1 hr before sunrise: (planets 7° apart)</p> <div></div>	<div>30</div> <p>Regulus 6° upper left of Venus.</p> <div></div>	<div>Morning Planets: Brilliant yellowish Jupiter and reddish Mars appear close together all month in the eastern sky before sunup. Jupiter appears 12 times as bright as Mars. On June 1 Mars is 9° upper right of Jupiter. On June 15-17 they fit within a 1° telescope field (see June 16). On June 30 Mars is 8° lower left of Jupiter. For most of June the two planets can be viewed together within the field of 7-power binoculars, which also show the brightest satellites of Jupiter.</div>		<div>June Planet Summary : Evening Planets: Venus is the brilliant "evening star" in the western sky at dusk. It sets over 3 hrs after sunset June 1, decreasing to 2 1/2 hrs by June 30. Venus continues moving rapidly (1° per day) against background stars; on June 2 it is to the left of Castor and Pollux, and at month's end it is approaching Regulus. Getting 750,000 miles closer to earth as each day passes, Venus grows noticeably in size this month when viewed through a telescope. But less of its sunlit side is turned toward us as it begins to swing between earth and sun. A good time for viewing the phase of Venus through a telescope is shortly after sunset, before the sky darkens much. Saturn below Pollux. See Jun 1-3, 10-12, 15.</div>		

Magnitudes of the Planets: Venus -3.9; Jupiter -1.9; Saturn +0.4; Mars +0.8. Notions of the Planets: Venus 29° eastward, from Gemini through Cancer into Leo. Mars 22° eastward, and Jupiter 5° eastward, in Pisces. Saturn moves 7° (minutes of arc) per day eastward in Gemini during first half of June.

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