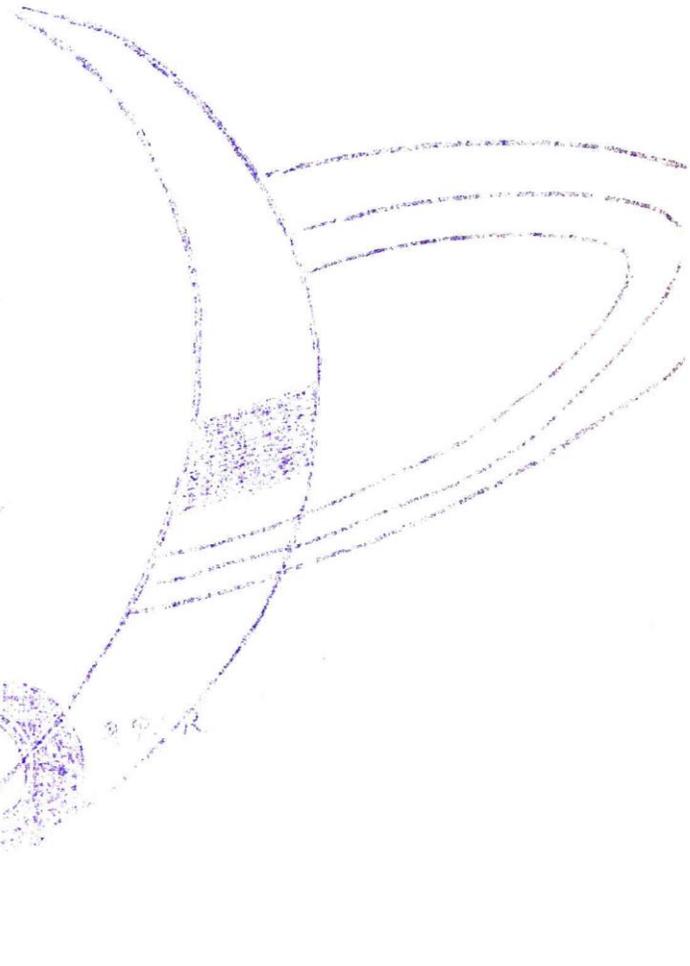


Nov. '69

The

WARREN
ASTRONOMICAL
SOCIETY



Planet Locations for the Month of November

MERCURY

Mercury, reaching superior conjunction with the sun on November 16th, passes from the morning to the evening sky but remains in the solar glare all month.

VENUS

Venus, at magnitude -3.4 in the morning sky, slowly moves toward the sun. At mid-month, it rises about the time twilight begins. Its nearly full disk will be 10".5 in diameter on the 15th. On November 4th Venus passes 0°.5 north of Jupiter and 4° north of Spica. The thin crescent moon (about 1½ days before new) may be glimpsed south of this trio on the morning of November 8th.

MARS

Mars moves from Sagittarius into Capricornus early in November, remaining a prominent reddish evening object low in the southwest all month. On the 15th, its magnitude will be +0.6, while its shrinking gibbous disk, 86 percent illuminated, will be 7".4 across. The nearly first-quarter moon will be southwest of Mars on the evening of the 14th.

JUPITER

Jupiter is in central Virgo, shining at magnitude -1.3. It rises some 1½ hours before the sun as the month opens and about 3½ hours by its end. On the 15th, the giant planet's disk will appear 31" in equilateral diameter, 29" in polar.

SATURN

Saturn gleams at 1st magnitude on the Aries-Cetus border, dominating that part of the sky. Having passed opposition on October 29th, the ringed planet rides high in the southern sky around midnight. On the 15th Saturn will show telescopically a polar diameter of 18", while the rings will extend 45".

URANUS

Uranus, some 7" southeast of the September equinox point in Virgo, rises nearly due east about 3½ hours before the sun at midmonth. With binoculars this 6th magnitude planet can then be found at right ascension 12^h 26^m.6, declination -2° 07' (1950 coordinates).

NEPTUNE

Neptune, in conjunction with the sun on November 20th, is unobservable all month.

November Meteors

The two week long Taurid shower will reach maximum about November 5th, when the moon is past last quarter. About eight slow-moving meteors per hour will be added to the normal sporadic activity. At maximum, the Taurid radiant lies at 3^h 32^m, +14°.

The moon, just past first quarter, will set before the radiant of the Leonid meteors rises high in the sky, when peak activity of this shower is reached on November 16th and 17th. But Leonid numbers are unpredictable; last year the shower was stronger for favorably located observers than was the annual Perseid display. On those dates, the Leonid radiant is at 10^h 08^m, +22°.

Articles taken from [Sky and Telescope](#) (November issue).

Diane Bargiel

USEFUL BOOKS ON ASTRONOMY FOR THE AMATEUR

By David T Ther

Every amateur observer has, at one time or another, wondered where he could find out which objects are most suitable and rewarding for observation. He then proceeds to begin searching for observing guides and lists of objects that are easily visible in moderate telescopes.

Having searched for this material myself, and invested in many such books and guides, I would like to give my recommendations and preferences with the hope that other members of WAS might benefit from the advice.

The first thing that most of us buy, is a star atlas. In this category, I highly recommend "Norton's Star Atlas", not only because of its content, but because it is readily available from most dealers in astronomy (Edmund Scientific Co. and Sky Publishing Corp. are two examples).

Norton's is a handbook of observing tips as well as a star atlas. It gives all sorts of information about observing planets, the moon (including a moon map), and deep space objects, and contains many definitions and explanations of astronomical terms. The star maps are more than adequate. Stars to 6½ magnitude are shown as well as hundreds of nebulae, clusters and doubles. Perhaps the most useful feature is the lists of "Interesting Objects" that are found between the star maps. These contain excellent information concerning doubles, variables, nebulae and clusters. They permit the user to know at a glance which objects are most interesting and what to expect to see.

I find the descriptive prose of Norton's to be interesting, as it is written in the descriptive style that is found only in older books on the subject (Norton's 1st Edition was published in 1910 and is now in its 15th edition). At a cost of about \$6, Norton's has to be the best all around deal for the amateur.

For those of us who have larger telescopes, it is wise to supplement Norton's with the "Skalnate Pleso Atlas of the Heavens". This atlas is on a scale of more than double that of Norton's, and shows stars to 7 ½ magnitude. Thousands of clusters, galaxies and nebulae are listed, each sort of object having a different color (galaxies are red, clusters green, Milky Way blue, etc.). There are six different colors in all. The large scale and deep coverage of this atlas make it very useful for both observers with setting circles and those that prefer to "star-hop" (a grid is provided for measuring distances). Obtainable from Sky Publishing Corp., the Atlas of the Heavens is available in a cloth bound edition (just revised and reprinted this year) for \$12.50, and a field edition at 2/3 scale and in B&W for \$4.00 (the field edition is unbound).

Cont'd.

Note: Most of the publications that appear in this article and in future articles are part of my modest collection of astronomy books. Those who would like to examine a particular publication should contact me. D.T.

RIDDLES OF ASTRONOMY: THE PLANETS

Saturn: If not formed by an exploding moon, where did Saturn's ring material come from?

Shear conjectures, rather than theories, are hesitantly brought forth by various authorities:

*That when the primal dust/gas whorl formed Saturn, another whorl nearby was perturbed (acted on by gravity) by the mother whorl and failed to condense as a whole, instead breaking up into billions of tiny eddies that then formed the components of the rings.

*That when an ancient comet skittered too close to Saturn, its non-solid head of loosely packed ice and stone particles—which is consistent with comet theory—did not need to burst into particles, the debris already existed and simply took up the pattern of whirling rings.

*That after the Saturn-whorl's original condensation into a ball (which turned molten through compression) a violent eruption—perhaps the splash of a huge meteor's fall—spewed lava-like droplets and steamy water vapor into space at less than escape velocity but with sufficient orbit velocity. The volcanic globs quickly cooled into hard stones and ice chips that remained in orbit, just as our rocket launched satellites keep circling earth (and by 1975 earth may have man-made rings after anywhere from 1,000 to 5,000 satellites are lofted).

Astronauts will have to examine the components of Saturn's rings directly before their exact composition and origin are established.

JUPITER: What is the Red Spot that independently lags behind the general rotation?

First seen prominently in 1878, the Red Spot is a huge oval—30,000 by 12,000 miles—that suddenly turned bright red to stand out against the dull brown of the South Equatorial Belt. The spot, which

has since faded to light pink and deepened back to red periodically, has its own private rotation rate, slower than the air belt around it. And the rate changes erratically, the Red Spot will sometimes lag fifteen minutes behind the mean value, then move faster to partly catch up again.

The Spot was first thought to be the smoky bubble produced by a gigantic volcanic eruption and later to be a patch of cohesive atmosphere colored red by bromine or nitrous fumes, but neither theory could account for its permanence (now close to a century). The Spot is today believed to be a semi-solid material, perhaps porous like asbestos or pumice, that is, light enough to remain suspended atop the porridge of Jupiter's atmosphere like a gigantic floating island. At times a less cohesive entity of thick gas that changes shape—the South Tropical Disturbance—overtakes the Red Spot and flows around it, bolstering the latter's island-in-the-sky concept.

But though entertained for generations by such atmospheric tricks, astronomers have no inkling of the eerie kind of world lies below—or if any world, in human terms, is there at all.

VENUS: Does the “phantom satellite” of Venus exist?

Perhaps inevitably, a moon of Venus was “discovered” in 1686 by G. D. C. Cassini, an early Italian astronomer, who had already gained fame by revealing four satellites of Saturn, which were authentic. He described the new moon as about one-fourth the diameter of Venus, almost as large as earth's moon. Since all Venus observations are against the sun, glare would make it hard to see any such body except briefly. In following centuries other astronomers claimed to catch a fleeting glimpse of D'Alembert, as the satellite was un-officially named by Frederick the Great of Prussia.

But by 1760, most astronomers pronounced the moon a myth. Various explanations were given for the false

observations: An illusion caused in imperfect telescopic lenses by stray flashes of sunshine, the sighting of a fixed star past which Venus skimmed during its travel through the Zodiac. The twentieth century's superb telescopes have failed utterly to catch any image on photographic plates of a moon for Venus.

However, it is still possible that a very tiny Venus Satellite does exist, which no telescope can ever resolve out of the blinding dazzle surrounding the mother planet. Tiny Deimos of Mars, only five miles wide, is barely detectable by giant modern telescopes, even while looking outward from the sun under the best "backlighting" conditions. Any Venus-circling object as small or smaller than Deimos would probably escape detection from earth. The Venus moon-hunt will be continued by robot or manned space vehicles sent from earth.

There remain the two major enigmas of Venus ...

URANUS: Why did Uranus alone, at the solar system's birth, become the upside-down planet?

The axis of Uranus is tilted not just a few degrees like earth's (23.5°) or the other planets, but an enormous 98° retrograde. This is so close to a 90-degree quarter circle that the planet's axial pole can point almost straight at the sun every forty-two years (accounting for an overhead sun occurring alternately at the poles). But, like any spinning gyroscope, Uranus remains "fixed" in space—the axial pole always pointing to the same star—so that one fourth of the way farther around in its solar orbit, it is the whirling equator that faces the sun broadside, to bring forth the second set of conditions outlined above.

(?? missing text??) sideways so that it is always "parallel" to the plane of its orbit instead of perpendicular. And, to complicate matters, Uranus also rotates backwards (retrograde) in relation to its orbital motion.

This seemingly bewildering set of planetary motions becomes quite clear if you use a round ball for Uranus and move it in a counter clockwise circle around a lighted lamp (sun). Tilting the ball from the perpendicular for fairly close to a quarter of a circle (98°)—while making it rotate clock-wise—will duplicate on the lighted and dark portions of the ball all the phenomena of Uranus that we have described.

Why Uranus is topsy-turvy, nobody knows. It violates every neat theory of planetary formation, all of which make a common premise that the sun, planets, and moons should rotate and/or revolve in the same counterclockwise direction. How should the ancient Uranus-whorl (using the cosmic dust/gas theory) make that incredible one-quarter flip-flop and end up spinning backwards while lying on its side?

Then the five moons of Uranus confound the astronomers even more.

Taken from RIDDLES OF ASTRONOMY
by Otto O Binder

Diane Bargiel

On a somewhat clear night for Warren, I viewed M-2 and M-15, both globular clusters. M-15 I have viewed on two occasions. It is a small globular cluster in Pegasus. The first night I observed M-15 was a smoggy one with a full moon hanging in the southeastern sky. I used my trusty 4½" reflecting telescope at 45x. Through it I saw a miniature globular with a much brighter nucleus. That same night, I looked at it with a 2" refractor and could not make it out clearly at 35x. I increased the magnification to 75x and it was recognizable again. The next time I viewed M-15, was a time when the skies were quite clear for my backyard, which is darker than most peoples' backyards. This is because our house sets back in from the road and most of the trees block the street lights. Now the only trouble I have is seeing past the trees. M-15 was quite a site that night with its irregular shaped nucleus and it had its fainter stars encircling it. M-15 is located in Pegasus northwest of the star epsilon in Pegasus and shines at magnitude 7.

M-2 is of magnitude 7 located in Aquarius. It is a large globular approximately ¾ as large as M-13 in Hercules. This cluster is funny in a sense because instead of having a bright nucleus all of its stars appear at the same magnitude or close to it. It is also located in almost a completely starless patch of sky. I used the 4½" to locate this Messier object. M-2 is located northeast of beta in Aquarius.

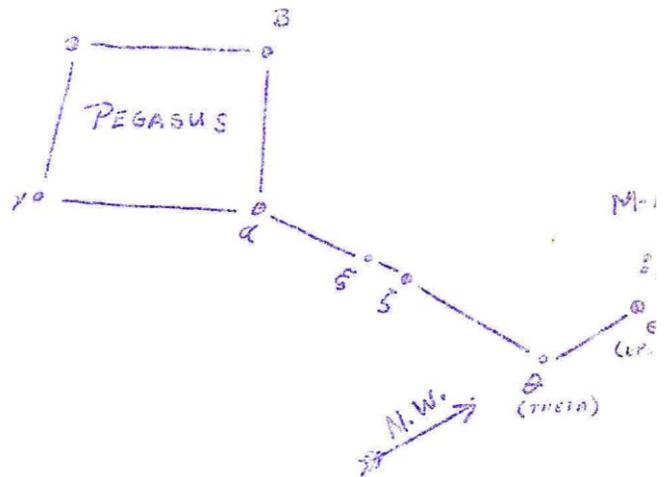
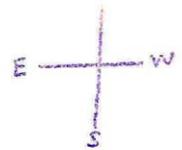
How To Locate M-15 and M-2



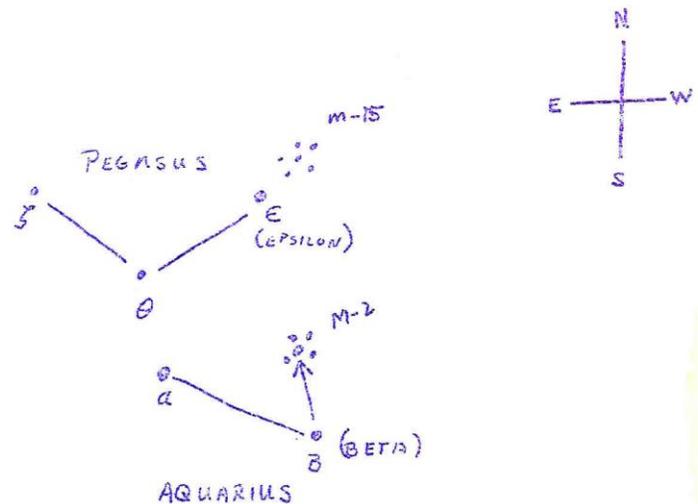
M-15



M-2



EXTEND LINE FROM THETA TO EPSILON, ONCE EPSILON IS IN FINDER CONTINUE NORTH-WESTERLY DIRECTION HALF THE DISTANCE OF THETA AND EPSILON WHILE LOOKING THROUGH EYEPIECE.



FIND EPSILON IN PEGASUS AND LOOK FOR A SECOND MAGNITUDE STAR SOUTH AND SLIGHTLY WEST. THIS STAR IS BETA IN AQUARIUS. NOW THAT YOU HAVE FOUND BETA MOVE YOUR SCOPE ⅓ OF THE WAY TOWARD EPSILON IN PEGASUS AND YOU SHOULD LOCATE M-2.

FRANK McCULLOUGH