

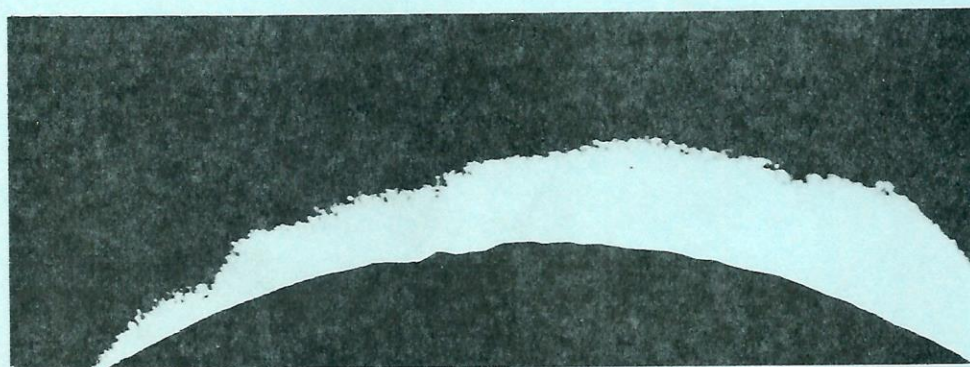
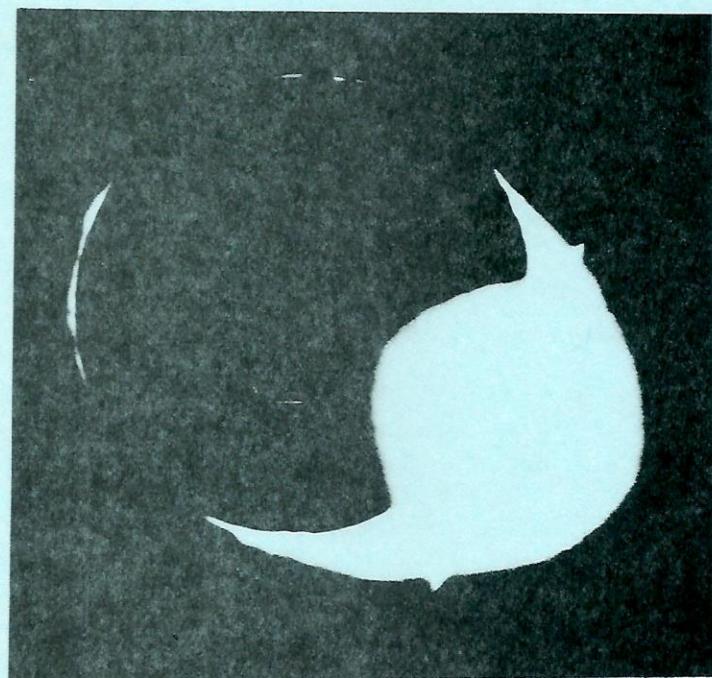
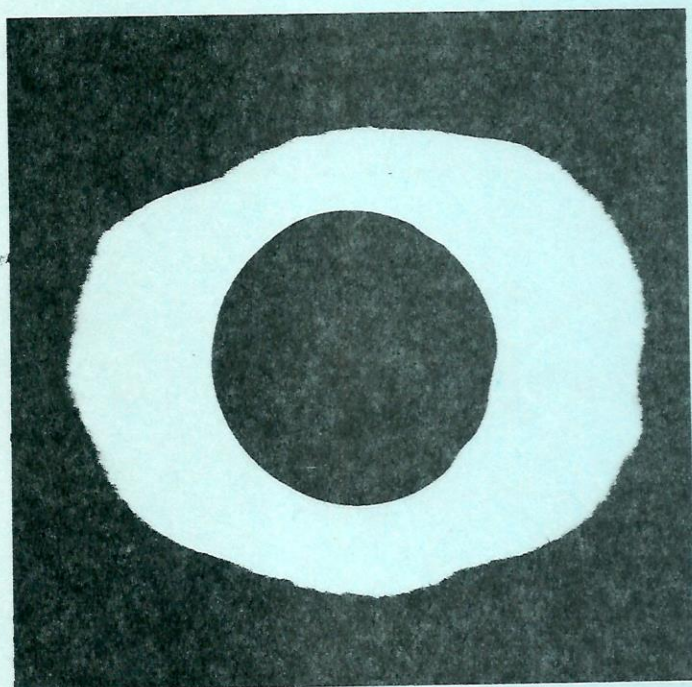
THE WASP

The Warren Astronomical Society
P.O. Box 474
East Detroit, Michigan 48021

MAY 79



ECLIPSE OF 79...



THE WARREN ASTRONOMICAL SOCIETY
PUBLICATION

This Month...

MAY 79

Editor – Jeff Stanek
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Assistant Editor – Brad Vincent
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SOCIETY INFORMATION

The Warren Astronomical Society (W.A.S.) is a local, nonprofit organization of amateur astronomers. The Society holds meetings on the first and third Thursdays of each month. The two meeting locations are listed below:

1 st Thurs.	Cranbrook Institute Of Science 500 Lone Pine Road Bloomfield Hills, MI	3 rd Thurs.	Macomb County Community College – South Campus K Building 14500 Twelve Mile Road Warren, MI
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Membership is open to those interested in astronomy and its related fields. Dues are as follows and includes a year subscription to Sky & Telescope Magazine:

Student - \$11.00	College - \$13.00	Senior Citizen - \$15.50
Individual - \$18.00	Family - \$23.00	

STARGATE LECTURE SCHEDULE

Chairman- Dennis Jozwik- 754-2037

Lectures are given at Stargate Observatory each weekend. The lecture will be either Friday or Saturday night, depending on the weather and the lecturers' personal schedules. If you cannot lecture on your scheduled weekend, please call the Chairman as early as possible so he may arrange for a replacement. Those wishing to use Stargate must call by 9:00 p.m. on the evening they plan to go out. The lecturers for the coming month are as follows:

May 4/5	Ray Bullock, 879-9458
May 11/12	Bob Dennington, 779-6354
May 18/19	Lou Faix, 1-781-3338
May 25/26	Dave Harrington, 879-6765

WAS Exchange

FOR SALE...8"f/6 reflector with 2.14" diagonal, mounted in 10" diameter tube – 50" long, no eyepiece focusing mount. Price \$100. Also 4" O.D. - 24" long, black iron stand that is ready to accept 3 legs and equatorial head (Pacific) for \$10; plus, a 22½ lb. counterweight with 1" hole and screw clamp for - \$10. Contact Roger Civic, 776-1673.

FOR SALE...3" refractor in very good condition. Completely equipped with the following: equatorial mounting with setting circles, three eyepieces, star diag., 2X Barlow, 6x30 finder, erecting prism, sun screen projector and accessory tray. Price - \$250. Contact Jeff Stanek. 751-1673.

FOR SALE...6" f/10 telescope. Good condition. Mounted on a lightweight tripod and equipped with clock drive. Price- \$250. Contact Joe Tocco, 573-8547.

WANTED... Complete equatorial mounting for 6 inch reflector. Call Beverly Wicks at 474-7234.

WANTED... 4¼" or 6" reflector in good condition, preferably with mounting. Call Jim Pintkowski, 879-0588

By: Jeff Stanek

SPRING MESSIER OBJECTS

Spring is the best time for observing Messier objects if you are crazy over galaxies. The reason for this is because the Virgo-Coma Berenices galaxy cluster is up in the sky. This cluster is one of the biggest clusters of galaxies known to man. Since galaxies are about the only Messier objects up in the sky at this time, I will describe 10 galaxies that are nice Messiers to find.

M63-NGC 5055. M63 is 6 degrees southwest of M51. It is 10 by 6 minutes of arc in size. It is fairly bright at magnitude 8.5. This galaxy has a bright nucleus which is mostly what you see in the telescope.

This galaxy is quite impressive in small telescopes.

RA=13 13 Dec=+42 17

M65-NGC3623. M65 is 20 minutes of arc away from M66. Both M65 and M66 can be seen in a low power field. M65 is 35 million light years away from our sun. M65's apparent visual magnitude is 9. M65 is 8 by 1.5 minutes of arc in size. Its class is Sa.

RA-11 16 Dec- +13 23

M66-NGC3627. M66 is 8 by 2.5 minutes of arc in size, very much like M65's size. M66 is very bright, and very large. Its class is Sb. M66 is as long as M65 but somewhat wider, being seen less nearly edge on. A great object for small telescopes, M65 and M66 are a great view in the same field of power.

RA-11 17 Dec- +13 17

M86-NGC 4406. This galaxy has an apparent visual magnitude of 10. It however, is not too faint for small telescopes. M86 is 2 by 1 minutes of arc in size. M86 is 20 million light years away from our own solar system. It is fairly bright and a very large galaxy.

RA-12 23 Dec- +13 13

M87-NGC 4486. M87 is 1.3 degrees southeast from M86. M87 is one of the brightest and largest of the Coma-Virgo galaxy cluster. M87 is 2 minutes of arc in diameter. It is surrounded by 500 known globular clusters. M87 shines at a visual magnitude of 8. It has a mysterious jet flowing from its nucleus that has been known to us for 50 years. However, it has probably existed for over 5000 years or more. This is a fine object for amateur telescopes.

RA-12 28 Dec-+12 40

M91-NGC4548. M91 has been a "missing" Messier object for years. It was thought to be a duplicate of M58, but W.C Williams suggested that it was NGC 4548, a 9.5 magnitude barred spiral galaxy. M91 is 4 minutes of arc in diameter. It is bright, and large. An easy object in a amateur telescope. M91 looks very nice in a low power field.

RA-12 32 Dec- +14 46

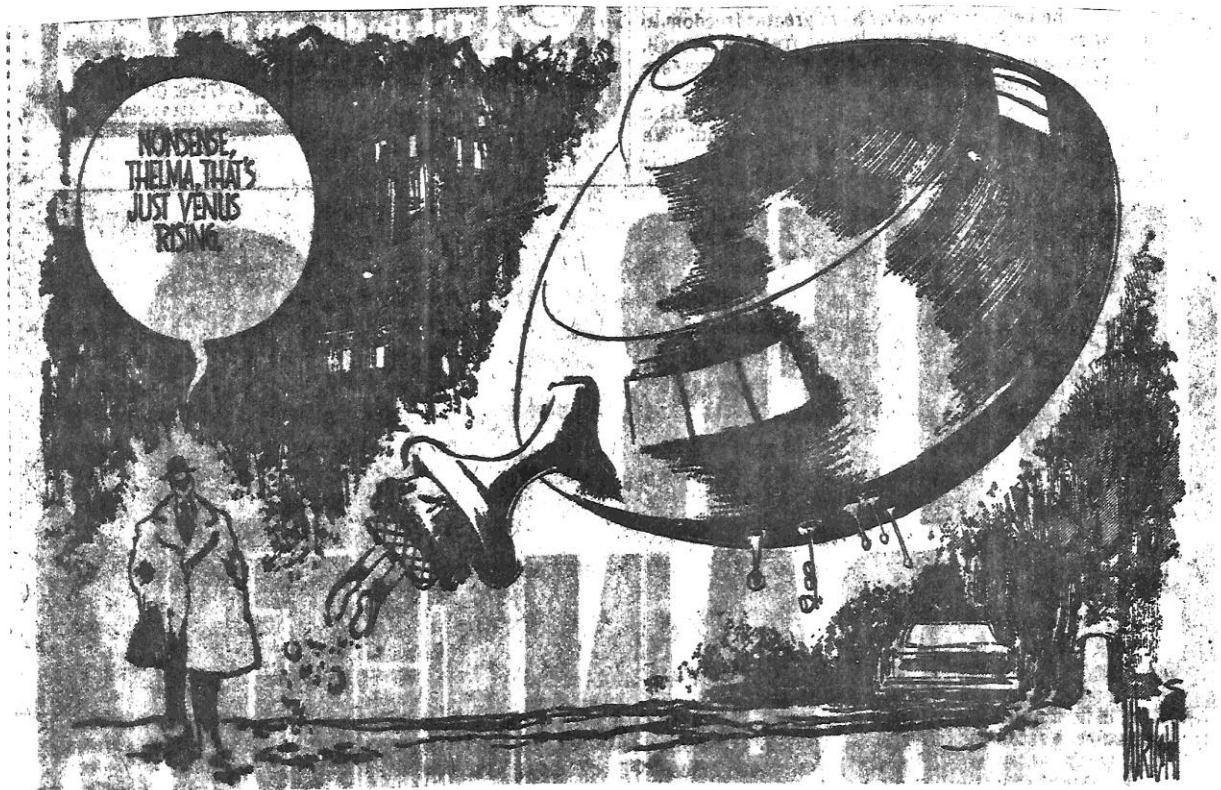
M94-NGC 4736. M94 is only 3 degrees north of the star Cor Caroli. M94 is 7 by 3 minutes of arc in size. It is seventh magnitude, making it a pretty bright object. M94 is about 14 million light years distant.
RA-12 48 Dec- +41 23

M95-NGC 3351. M95 is one of a trio of ninth magnitude Messiers located in the constellation of Leo about a third of the way from Regulus to Denobla. It is about 25 million light years away from our solar system. M95 is bright and large, making it a fairly easy object for galaxy hunters out there. It is 3 minutes of arc in diameter.
RA-10 41 Dec- +11 58

M96-NGC 3368. M96 has a larger spiral than its neighbor M95. M96's size is 6 by 4 minutes of arc. M96 is at the same distance away from us as its neighbors. M96 is very bright, and very large, making it as one of the easiest galaxies to find. M96 is less than one degree away from its companion, M95. It has a silver gray color about it making it one of the few galaxies you can identify color from it.
RA-10 44 Dec- +12 05

M101-NGC5457. Our last object to discuss, M101 is one of the easiest galaxies to find in the sky. It has a apparent visual magnitude of 8, making it fairly bright. M101 is also called M102, due to a mistake made in the eighteenth century. It is 22 minutes of arc in size. M101 is about 15 million light years away from us. It contains many hot, blue stars making it so bright. Its class is Sc. M101 is a large spiral seen straight on.
RA-14 01 Dec- +54 35.

I hope you will gain some help from this article in finding those Messier objects. My next article in this series will be this fall. So, in the meantime, good hunting!!!



APPARENT POSITIONS OF THE SUN AND PLANETS, 1979

By representing numerical values from this table as points on an appropriate star chart, one obtains the apparent positions of the sun and planets relative to background stars as observed from Earth. Positions can conveniently be plotted on any celestial globe or star map on which the ecliptic is marked off in degrees of longitude. Two examples of such star maps are THE NIGHT SKY (a rotating planisphere which can be adjusted to show the visible sky for any selected date and time), and SC1 CONSTELLATION CHART -- EQUATORIAL REGION. These charts are available from Sky Publishing Corporation, 49 Bay State Road, Cambridge, MA 02138. Write for their free catalog of publications, Scanning the Skies.

This table gives, for the 1st and 16th of each month, apparent geocentric positions of the sun and naked eye planets. Each position in the table is expressed as a pair of numbers in the ecliptic system of coordinates. The first number in each pair is the longitude, measured eastward along the ecliptic beginning at the Vernal Equinox; the second number is the latitude, measured perpendicularly north (+) or south (-) of the ecliptic. All values are stated to the nearest degree.

<u>Date</u>	<u>Sun</u>	<u>Mercury</u>	<u>Venus</u>	<u>Mars</u>	<u>Jupiter</u>	<u>Saturn</u>
1979 Jan 1	280, 0	259, +1	234, +4	285, -1	127, +1	164, +2
16	295, 0	280, -1	248, +4	296, -1	125, +1	163, +2
Feb 1	312, 0	306, -2	265, +3	309, -1	123, +1	163, +2
16	327, 0	332, -2	282, +2	321, -1	121, +1	162, +2
Mar 1	340, 0	356, 0	297, +1	331, -1	120, +1	161, +2
16	355, 0	8, +3	314, 0	343, -1	119, +1	159, +2
Apr 1	11, 0	358, +2	333, -1	355, -1	119, +1	158, +2
16	25, 0	359, -2	351, -1	7, -1	120, +1	158, +2
May 1	40, 0	15, -3	9, -2	18, -1	121, +1	157, +2
16	55, 0	39, -2	28, -2	30, -1	123, +1	157, +2
Jun 1	70, 0	72, +1	47, -1	42, -1	125, +1	158, +2
16	84, 0	103, +2	65, -1	53, 0	128, +1	158, +2
Jul 1	99, 0	124, +1	83, 0	64, 0	131, +1	159, +2
16	113, 0	134, -3	102, 0	74, 0	134, +1	161, +2
Aug 1	128, 0	128, -5	121, +1	85, 0	137, +1	162, +2
16	143, 0	125, -2	140, +1	95, 0	141, +1	164, +2
Sep 1	158, 0	146, +2	160, +1	105, +1	144, +1	166, +2
16	173, 0	175, +1	178, +1	115, +1	147, +1	168, +2
Oct 1	187, 0	201, 0	197, +1	124, +1	150, +1	170, +2
16	202, 0	223, -2	216, +1	132, +1	153, +1	172, +2
Nov 1	218, 0	242, -3	236, 0	141, +2	156, +1	173, +2
16	233, 0	242, -1	254, -1	148, +2	158, +1	175, +2
Dec 1	248, 0	230, +3	273, -1	155, +2	159, +1	176, +2
16	263, 0	245, +1	292, -2	160, +3	160, +1	177, +2
1980 Jan 1	280, 0	268, -1	311, -2	164, +3	160, +1	177, +2
Positions of Bright Stars:		<u>Aldebaran</u> 69, -5	<u>Pollux</u> 113, +7	<u>Regulus</u> 150, 0	<u>Spica</u> 204, -2	<u>Antares</u> 249, -5

Subscribers to the Abrams Planetarium Sky Calendar (\$2.00 per year) will receive a 1980 edition of this table with the January 1980 issue. Available from Abrams Planetarium, Michigan State University, East Lansing, Michigan 48824.

Data compiled by Timothy D. Skoneieczny, for Abrams Planetarium, Michigan State University.

ALL ABOUT CALCULATORS

By
Larry F. Kalinowski

PART I - WHERE'S THAT EQUAL SIGN???

Quite often the prospective calculator owner goes out and buys a calculator strictly on the number of keys that the keyboard holds. Not only is this a mistake, it can lead to serious frustration on the part of the owner. It's true that more keys mean greater calculator power but it's not always true. Some models have keys with dual and trip e functions, thereby reducing the clutter that can appear on some calculators.

There's no doubt about it, those electronic marvels are here to stay. You and astronomy have everything to gain by using them! from the calculation of the latest comet's position to the design of that Newtonian telescope you're working on. However, before you plop down that cold hard cash on the counter, there are some basic things to know that will avoid that frustration mentioned above.

There are two basic systems in the pocket calculating world today. Both of those systems can be described by the two most popular manufacturers of calculators today. Texas Instruments and Hewlett Packard. From now on the two mentioned companies will be referred to as T.I. and H.P. Of course, there are special calculators that do only special things, like calculate biorhythms, but by and large, the general calculator world is divided into two groups.

T.I. calls its system an "algebraic" system. According to T.I. all problems can be entered just as you might say them if you were to recite them aloud. This isn't exactly true, as we shall see in a little while. H.P. has an R.P.N. system. That's short for reverse polish notation. No, we're not kidding, R.P.N. is typical fare in large computer systems, because data is handled in a slightly different way. H.P. says their system is faster when it comes to solving problems. Let's do a simple addition problem in both systems. You'll be better able to judge how each system works. How about the sum of 2 and 3.

STEP	T.I.	H.P.
1	2	2
2	+	enter
3	3	3
4	=	+

The H.P. system doesn't use an equal sign. You won't find one on the calculator. However, there is one key that you won't find on the T.I. systemthe "enter" key,

POSITIONS OF THE PLANETS IN THEIR ORBITS, 1979

This table gives, for the 1st and 16th of each month, heliocentric longitudes of the planets out to Saturn. All values are stated to the nearest degree. The source of this information is The American Ephemeris and Nautical Almanac.

These values can be used for plotting the positions of the planets on a chart of their orbits. We recommend Inner Planet Chart (S511) and Outer Planet Chart (S512), available from Sky Publishing Corporation. To plot the position of a planet on an orbit chart, first look up its heliocentric longitude in the table below. Then lay a straightedge connecting the sun to the corresponding point on the circular longitude scale at the chart's outer edge. Make a tick mark where the straightedge crosses the planet's orbit.

<u>Date</u>	<u>Mercury</u>	<u>Venus</u>	<u>Earth</u>	<u>Mars</u>	<u>Jupiter</u>	<u>Saturn</u>
1979 Jan 1	203	133	100	287	122	158
16	248	157	115	297	123	159
Feb 1	293	183	132	307	125	160
16	346	207	147	316	126	160
Mar 1	56	228	160	325	127	161
16	145	252	175	334	128	161
Apr 1	209	277	191	344	129	162
16	253	301	205	354	131	162
May 1	296	325	220	3	132	163
16	351	348	235	12	133	163
Jun 1	81	14	250	22	134	164
16	164	38	264	31	135	164
Jul 1	219	62	279	40	137	165
16	262	86	293	48	138	165
Aug 1	309	112	308	57	139	166
16	10	136	323	65	140	166
Sep 1	106	162	338	74	142	167
16	181	187	353	81	143	167
Oct 1	231	211	7	89	144	168
16	273	235	22	96	145	169
Nov 1	323	260	38	104	146	169
16	32	284	53	111	147	170
Dec 1	124	308	68	118	149	170
16	193	331	83	124	150	171
1980 Jan 1	242	357	100	132	151	171

Approximate future orbital positions can be calculated by increasing the longitudes by the following mean motions per month elapsed:

125	49	30	16	2.5	1.0
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Data compiled by Timothy D. Skonieczny, for Abrams Planetarium. Michigan State University.

Over recent months, I have endeavored in a home-spun experiment concerning the electric power from Detroit Edison. The frequency of the current powering our lights, appliances, telescope clock-drives (yum)... well, in fact all of Detroit and southeast lower Michigan (minus Pontiac city) is supposed to be at a fixed rate of sixty hertz or sixty cycles per second. This is according to Edison, but my experiment showed how this is not a fixed rate as Edison's frequency controllers supposedly promise us.

The concept and actual procedure of the experiment are quite simple: I wished to monitor the frequency of our power by means of small electric motor. I used a home electric clock, since this would be the most practical. The other part of the job employed the Windsor radio station CBE* on the AM band. At 1 pm everyday (daylight or standard time) CBE broadcasts the official 1 pm tone from CHU Canada the official time standard signal of Canada (which is identical to WWV, Fort Collins, Colorado).

The clock remained untouched throughout the experiment and a power interruption signal on the clock was not activated. On every available day (near 1 pm) CBE was turned on, and the second hand of the clock was monitored. Since it would be impossible (and unimportant) to try to align the second hand to the signal (i.e., the clock reads 00 seconds as the tone starts). Therefore, the readings on the clock were taken as is. In this experiment, the tone usually began at about 43 - 44 seconds**.

For specifics, the first reading was taken on 30 April 1978. On that date, I recorded the 1 pm tone to begin at the 42½ second mark. The recording days continued sparsely until June, thereafter readings were taken a few times per week. The overall results show that the deviation of frequency in cycles per second with respect to our clock, is plus or minus four-and-a-half seconds, readings occurring between the 39 and 48 second mark.

The following graphs innumerate the data obtained through the observation time April 30, 1978 to October 29, 1978. Part A is a graph of date vs. time reading, which quantitatively show the erratic pattern of fluctuations in the timings. Part B shows the relative occurrences of timing values. Remember that the timings reflect the rate at which the second hand of the clock is being run, which in turn reflects the power frequency input to the clock - run on current from Detroit Edison. Nonetheless, it shows how, when we believe our power source gives us a continuous, unchanging power frequency we can use basic, home-front apparatus to check this hypothesis. Ordinary synchronous electric clock and a radio with a station giving some time signal from one of the two available government bureau of standards will do. (Try CBE, since it gives a clear, accurate signal from CHU, one of the two time signals received locally). In the future, a more accurate experiment (perhaps a regular, hourly monitoring of the frequency from Detroit Edison) would be desirable.

*- CBE = 1550 kHz

** - with an accuracy of $\pm \frac{1}{4}$ second ($\frac{1}{2}$ second graduations used)

By: Dave Dobrzelewski

MAY
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER

